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Volume 1, No. 1

Diving

& Snorkeling

Florida's

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**Finders
Keepers?**

**The
Philippines**

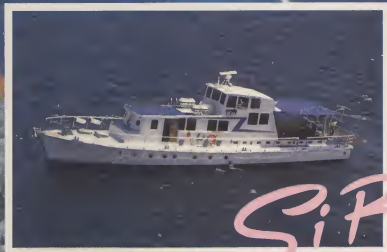
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mersible, divers harvest valuable pink coral in Hawaii.

Keepers

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n . . . The Ultimate in Diving Knives

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& Snorkeling



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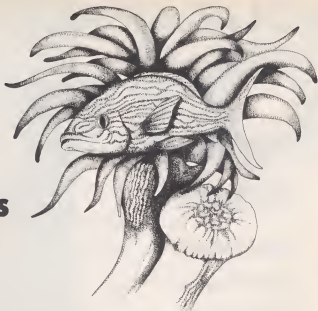
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SCUBAPRO strongly recommends anyone interested in learning to scuba dive seek professional diving instruction in a program certified by one of the national organizations.

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Illustration by Anna Schettino



Editor's Page

Let's admit it . . . often as we slip beneath the surface of the sea, some little gremlin deep in our mind says, "This could be it!" Regardless of the overwhelming body of facts to the contrary, when we level off at 50 feet and look out over the coral and sand bottom, we hope to see a pirate's treasure chest spilling gold, silver and jewels. For the briefest moment, we entertain the possibility, no matter how remote, that we will find our own private, little Atocha.

Actually, in the right parts of the world, the chance of stumbling on a gold coin or a whole pile of them is not all that improbable. On page 12, Robert Burgess will rekindle your interest with accounts of several divers who have discovered respectable little treasure troves. Bob will also dispell any fears you harbor about having to smuggle your booty ashore in the dead of night to avoid the authorities. In "Finders Keepers," Bob explains current salvage laws and how divers no longer have to fear confiscation of any treasure they might find.

Once you've exchanged your gold coins for something easier to carry, say travelers' checks, Robert McQuillin suggests just the place to spend them. Bob recently traveled to the Philippines and reports the diving is out of this world. In "Too Great a Temptation" on page 40, Bob highlights some of the fantastic diving he experienced and explains how to make the trip yourself. The "temptations"—how about the chance to encounter a whale shark! One diver did just that on her checkout dive.

Closer to home, Cathie Cush checked out Mexico's Cozumel Island. Although Cathie is a veteran diver and will soon begin her instructor's course, she found the currents off the island worth mentioning. Although the diving was excellent, Cathie felt divers should know they will encounter currents.

We called Jim Hollis a dive shop owner in Orlando, Fla. for another opinion. Jim, who has led 54 trips to Cozumel, agreed currents are present but said they had never been a problem even for novice divers. Jim said the currents were more pronounced in shallow water than in deeper areas and off the walls.

Jim was more concerned with problems his divers have recovering deposits made on rental mopeds when they are returned and claimed to be damaged. Jim has also had problems with restaurant checks which include items not ordered or served. Jim suggests renting mopeds only from the larger hotels and requesting separate checks at restaurants.

As the winter travel season is at hand, divers headed for distant shores should read Eric Hanauer's article on page 36. Eric goes through a step-by-step procedure for preparing your camera equipment for a trip and explains how to keep it working throughout your vacation. Those same gremlins who set our minds to dreaming of sunken treasure have a way of working a grain of sand into an O-ring and flooding your camera just as that picture of a lifetime comes into focus.

Edward Montague

The Hydrodynamic Legend Is Born

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Appropriately named Sea Wing, these remarkable new fins combine the hydrodynamic features of a fish's fin with the principles of aircraft technology. The hydro foil shaped blades of the Sea Wing are not designed to simply push water backwards but to provide lift that translates into forward motion for the diver throughout the entire power stroke. The wing shaped blades act similarly to aircraft wings. Instead of wings lifting an airplane against the force of gravity, the specially designed blades of the Sea Wing push the diver forward. Most fins create movement through opposing pressure waves. The Sea Wing uses hydrodynamic lift to produce forward motion.

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Bo Bartko, above, examines pink coral which will ultimately be fashioned into jewelry, below.

Submersible snatches a rich harvest deep in Hawaiian waters.

In the Pink

By Ellsworth Boyd



If Bo Bartko had appeared on the old TV show, "What's My Line?" he would have stumped the whole panel. His line is "Underwater Prospector," and his office is a one-man submarine he pilots daily to the ocean floor 1,200 feet below.

Always "thinking pink," Bartko searches for rare pink coral trees growing in underwater canyons six miles off Makapuu, Hawaii. Bartko looks forward to each new day and an eight million dollar pink coral bonanza that continues to soar as he sinks.

Bartko works for Maui Divers, Ltd., a firm that started with three people in 1958 and now employs over 500 picking, processing, designing and marketing pink coral jewelry. Maui Divers has moved its factory to Honolulu, but retains the Maui Island name.

At 1,200 feet, Bartko works the upper edges of the sloping bed, operating a shear which cuts the pink coral tree at its base and a claw which drops it into a large wire basket on the bow of the vessel. Lying face down in the 17-foot-long *Star II* submarine, Bartko peers through the front portal, selecting only the largest specimens from the bed.

Faint traces of sunshine penetrate the depth, like pale moonlight engulfing the ghostly undersea garden. But with the sub's lights beaming 2,000 watts, Bartko creates his own 50-foot visibility a quarter of a mile down in the nearly barren landscape.

"Marine life is sparse down there," Bartko explained, "mostly crabs, eels, sharks and anglerfish. Sometimes amber-

jack swim around the sub, taking advantage of the lights to feed. I see red snappers too, but they're skittish of the lights.

"Three-to four-foot squalus sharks hang on the perimeter, cruising in, then out again. Occasionally I spot an eight to ten footer, appearing then disappearing in the shadows behind the vehicle. Once in awhile a big ray with a ten-foot wing-spread will glide past, but most of the creatures lay back on the perimeter where it's hard to tell what they are."

Harvesting is best when the currents are slack, but Bartko's best laid plans sometimes go astray. Tides and currents are not always predictable—that's when the veteran pilot has his work cut out for him. I asked Bo what he would do if the *Star II* were swept into one of the small caves that dot the drop-off.

"I'd just wait and be swept out again," he smiled casually. "It's tidal—what goes in has to come out."

"The *Star II* was built by General Dynamics," Bo said, "mainly to recover objects and inspect offshore oil rigs. It's got a long tail for stability, making it difficult for me to harvest on a downgrade. It won't turn quickly either, so I try to line the coral up with the cutter in order to get the tree on the first run.

"If I don't get it on the first try there might be a little cussin'. But if I accidentally drop a nice piece into a crevice, there's lots of cussin' because chances are I'll never retrieve it."

Bartko usually stays down from four to five hours, maintaining radio contact with the mother ship every 30 minutes. He has enough oxygen for 36 hours, but his day's work is limited by the charge in the 20 batteries aboard the sub and how hard they are used. The three motors—two H.P.



Holokai tows the LRT and *Star II* to dive site.

each—work hardest in strong currents.

To surface, the pilot uses compressed air to blow water out of the ballast tanks. In case of mechanical failure he can bob to the surface by manually releasing the 300-pound steel skid attached to the belly of the sub.

A 50 to 75-pound harvest is a good day's strike in the Mother Lode of the Makapuu pink coral fields. The biggest load he ever retrieved weighed 150 pounds—not bad with prime pink coral valued at \$400 per pound!

"If the batteries didn't wear down," Bartko smiled, "I'd stay down eight hours and never quit. It's just like prospecting for gold—you're always looking for a strike just over the next hill. People can't imagine what I do down there, but I'm busy from the moment the divers break me free."

The divers are Riki Inada, Terry Kerby and Troy Goodman, who launch the sub from the deck of a twin-pontooned raft called an LRT—Launch Recovery Transport vehicle. Towed behind the mother ship *Holokai*, with the *Star II* chained to its deck, the LRT is flooded down to 60 feet at the dive site. Beneath the choppy surface waters, where the turbulence subsides, the divers unchain the submersible. As it drifts free, Bartko begins the 1,140 foot descent. This method of launch, transport, and recovery eliminates problems associated with surface launching in choppy waters.

Wearing twin tanks and medium-size fins, (the smaller the fins, the easier it is to walk on the deck of the LRT), the divers swim underwater about 40 yards from the mother ship to the LRT. Although they escape the choppy surface waters, they often encounter strong underwater currents while making their way to the transport vehicle.

To initiate launching, Inada climbs into



Ellsworth Boyd, a professor of Education at Towson State University, Baltimore, Maryland, writes about diving as an avocation. His work has appeared in every major diving publication.



Divers prepare to unchain *Star II*.

a small cockpit at the stern of the LRT, waiting for Captain Dave Sefelt or deck hands Roger Gray and Terrell Cook to give the dive signal from the *Holokai*. Inada in turn, signals his support divers to open the vent valves, while he opens the variable ballast vent valves.

Like a slow motion scene from a science fiction movie, the LRT, its strange cargo lashed tightly to the deck—a bespectacled man inside peering out—slowly sinks beneath the surface.

"At 60 feet, in the indigo blue water, it's much calmer," Kerby said. "That's where we get our 'hover,' a perfectly balanced, almost motionless LRT. The pilot maintains the hover while the support divers unchain the *Star II*."

Although it's routine to them the divers still get a thrill, akin to launching a space capsule, as this strange drama unfolds at 60 feet, six miles at sea.

"Bo is real good," Kerby said. "He can take off and land that sub with the greatest of ease. We just guide her off and he gets her underway. Then we blow the ballast and the LRT returns to the surface, still attached by a towing hawser to the *Holokai*. We swim back to the mother ship and wait for Bo to return four to five hours later."

For the divers, launching isn't the only drama of the deep. They're often accompanied by sharks, occasionally a dozen at a time, attracted by the unusual activities in this usually sublime environment.

"We see a lot of white-tip oceanics," Inada said, "sometimes alone or in pairs. About a dozen tigers cruised above us

one time when we were hovering and preparing to release the sub. They're likely to appear at launching or recovery, sort of out of nowhere if you know what I mean. The only time I've seen them come close is during mating season. But we stick together and keep an eye on them. That's when the 40-yard swim back to the ship seems a lot longer!"

When the *Holokai* returns to the dock, its precious cargo is unloaded, sorted and soaked for several days in fresh water. When the slime and polyps fall off, the coral is cleansed with a power hose and shipped to the factory where it is stored in a warm, dry room. Once the moisture has been sapped from it, the harvest begins its fairytale transformation.

Like Cinderella, its beauty is deceiving, but thanks to wizards like Carl Marsh, the disguise is unveiled. A seasoned jewelry designer who apprenticed in England, Marsh and 14 other in-house designers fabricate custom pieces for mass production. Responsible for original designs and models in 14-karat gold, Marsh and his co-workers, through unique planning and production techniques, maintain a high quality in coral jewelry.

All gold casting is done by the lost wax method. To cast a ring for instance, a wax model is made first. Then plaster of Paris is poured over it. When the plaster dries, heat is applied to melt the wax away. Then gold is poured into the plaster mold, casting an individualized mounting for an exquisite piece of pink coral. The final product, a precise combination of mount-

ing and stones, results in a handmade piece of coral jewelry totally different from anything else on the market.

Such a ring, depending on size and quality of the gemstone, retails for \$40 up to \$5,000. The highest priced item may be accented with jade, pearls, sapphires, rubies, opals or emeralds. This is a "one-of-a-kind" piece, but there are other mass production pieces in gold-filled styles that retail for less. The modest prices on these latter pieces enable the retailer to select merchandise which will appeal to a broad cross section of the buying public.

Some of the 200 assembly line workers in the factory saw, sand, polish and buff the coral until a beautiful lustre appears. Then the precious stones are set in the various findings: rings, pendants, pins and tie-tacs. A fascinating part of the factory is the production line room where workers buff and finish the solid gold findings. A large snaking duct arches overhead, gently sucking up tiny specks of gold dust buffed from the findings. Collected on a matted screen, their value mounts over the years, too precious to be wasted.

Dr. Richard Grigg of the University of Hawaii, world renowned authority on precious corals, works closely with Maui Divers to conserve the resource. Aided by state and federal funds, the latter from Sea Grant, Washington, DC., Dr. Grigg is a strong advocate of conservation. He recommended that all harvesting be selective and dredging be outlawed. Grigg and Bartko designed the harvesting claw and collection basket for the *Star II*, ensuring a selective approach for the harvest of pink coral.

Through selective harvesting, the amount picked can be limited so that it doesn't exceed the growth rate of the coral. This permits prolonged use of the coral bed and contributes to its conservation. Grigg isn't worried about the depletion of the coral as long as Maui Divers follows his recommendations, the same ones provided for in the statutes set by the Department of Land and Natural Resources.

Bartko selects only the large, mature trees from the forests growing on the Makapuu bed. Others will die of old age while some might succumb to predators such as sponges that attach to the coral and suffocate it. Bo has spotted thousands of young, healthy trees in the Makapuu area and feels sure there are plenty of other beds to be found.

Thanks to the fusion of science and industry, man has uncovered a precious underwater resource that's benefiting hundreds of workers in Hawaii. It's also a boon to thousands of jewelry outlets throughout the world. And as for milady, she's "thinking pink" too, delighted with this new exotic jewelry from the submarine world around our mid-Pacific archipelago. S



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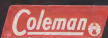
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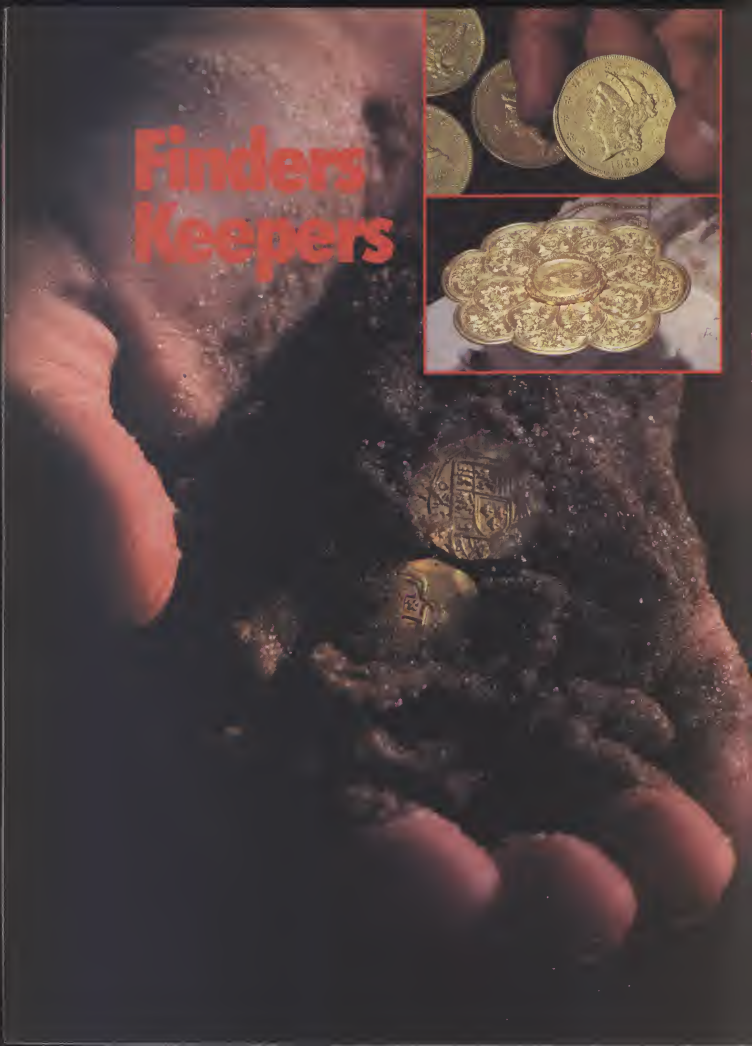
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Finders Keepers



At left are several of the coins recovered by Florida youths in 14 feet of water. Below is the gold tray recovered by Alex Kuze.

By Robert Burgess

It was one of those absolutely perfect days for diving. A Florida sun glazed a perfectly calm Atlantic Ocean gleaming like a giant sapphire as far as the squinted eye could see. Three breathless youths stood on a small dune not far from Highway A1A and couldn't believe their good fortune. Instead of crashing waves of roiled brown water, it looked almost turquoise with long rows of gentle combers rumbling hollowly down the beach.

Whooping joyfully, the three diving buddies charged toward the water, hauling their heavy equipment awkwardly with them. Eagerly they donned their gear at the water's edge, the two experienced divers, Jim Ryan and Randy Lathrop, finished a bit faster than recently certified Alex Kuze. It wasn't lobster season yet, but the trio intended to case the reef for Florida crawfish so they would be ready for the opener.

Together they made a smooth beach entry, swam out to the low limestone reef in 15 feet of water and submerged. Turning north, they swam close to the heavily holed surface of the craggy reef covered with an undulating carpet of verdant seaweed. Carefully they peered into all the openings for lobsters.

The divers worked their way along this rocky barrier until it began to dwindle away. They then crossed over it and headed south, examining the face of the reef. Periodically they spotted the telltale antennae of Florida crawfish watching them from various rocks and crevices. Mentally the divers noted their hiding places with the intention of returning once the season opened.

Eventually, the two more experienced divers worked on ahead, leaving Kuze to bring up the rear. Kuze was taking his time, absorbing the scenery, pausing at every crevice to let his eyes adjust to the shadowy interior that might conceal a hefty lobster. At one crevice as Kuze peered into the gloom he saw something that was neither fish nor fowl, rock or reef. It gleamed dull yellow. Gingerly reaching into the shallow pocket he tugged it out.

It was a yellow metallic plate that looked too shiny to be anything but somebody's fast-food throw-away. Probably fancy plastic. Kuze almost tossed it aside but decided instead to at least show it to the others.

When Randy Lathrop realized his buddy Kuze wasn't at their heels a moment later, he turned back looking for him. "I could see Alex swimming toward me out of the blue, and he had something in his hand," reported Lathrop later. "As he came nonchalantly into focus, I could see a bright yellow object in his hand and a bewildered look on his face."

Hoping against reason that the too-new piece of shiny pressed metal might be worth something, Kuze held out his find questioningly. Suddenly, he was amazed to see Lathrop's eyes grow wide behind his mask as he started screaming into his regulator!

On the surface the three divers realized they had something a lot more valuable than a throw-away fast food container. It was an exquisitely carved gold tray shaped like the flattened petals of a sunflower. Underneath was a sort of wide pedestal, also of solid gold. When everyone stopped shouting madly for joy, they started to realize the full significance of their find.

Obviously it was treasure, probably from one of the 1715 ships known to have foundered along that coast south of Cape Canaveral. But more than that, what the boys had found was illegal to possess. They had accidentally picked up a rare and probably quite valuable artifact on ocean bottom wetlands belonging to the state of Florida. For all they knew, they were trespassing in an area already under contract to a treasure salvor working a state salvage lease in a specified historical

... And then there are the days when everything is solid gold!

Coinshooters armed with metal detectors head for beaches known to produce artifacts after every storm.



Robert Burgess is a Florida based free-lance writer and photographer.

area—one in which they could be prosecuted for doing any freelance treasure hunting!

Under similar circumstances, if you as a sport diver accidentally found an extremely fine golden treasure such as this, what would you do?

Drop it like a hot potato?

Jam it in your wetsuit and catch the next flight for Switzerland?

Sneak it ashore and try to sell it to the highest bidder at a local bar?

If you chose any of the above, you goofed. That kind of thing might have been all right in the past, but it's not necessary today. Times have changed. Today's divers under such circumstances stand a better chance of not getting ripped off by playing it straight, just the way Alex Kuze, Jim Ryan and Randy Lathrop finally did.

Granted, they were initially undecided. Tucked inside a wetsuit and smuggled ashore, the three coveted their prize, mulling over their next move. When eventually all avenues and possible repercussions were considered, they made the correct move. A lawyer representing the three youths reported their find to the state.

At that time, some state representatives in charge of such matters as offshore salvage rights of historically valuable materials, would have gladly fried any sport diver who dared show up with such a valuable find. Look what they tried to do to one well-known treasure hunter caught bringing in a cannon from a site he had no lease on.

Fortunately, however, the government agency was even then undergoing a transition in which there was a growing realization and general effort evolving that it was far better to find some way to work with sport divers who were not intentionally breaking the law, then to jump in and prosecute each and every diver caught breaking this law.

This more level-headed reasoning was applied in the case of the accidentally found gold tray. Rather than punish the finders for possession of an artifact taken from state land already under contract to a treasure salvor, Florida agreed to let the finders keep half of the appraised value of the find.

This was agreeable to the youths. The tray was appraised at \$23,000. The three divers accepted six rare 8-escudo gold coins dated 1713 valued together at \$12,500. While Florida has no funds to purchase artifacts, it was able to ex-

Scattered all over the bottom were hundreds of gold coins.

change already salvaged coins for such finds. These coins were part of Florida's quarter share after a division with Real Eight's east coast salvage of treasure from the 1715 fleet. In this transaction, Florida gained a unique artifact for its museum display which shows the public an example of early 18th century colonial craftsmanship. The youths gained rare gold coins—for each of them although not all were finders of the rare plate—coins that in time will appreciate in value by leaps and bounds, enabling each of the divers to one day cash in on their good fortune to the tune of big bucks.

How common are chance treasure finds along Florida's east coast?

More common than you think, and there are definite reasons why.

Take the little known case of sport divers

James Gordy and Albert Ashly. They too were lobster hunting the same low limestone reef that parallels the east coast of Florida, not many miles to the south of where the tray was found. As the two finned slowly along the bottom in 12 feet of water, James Gordy saw something on the low formations that startled him. Excitedly, he yelled and pointed. His companion, Albert Ashly stared wide-eyed at the rocks. Neither believed what they saw, for scattered all over the bottom were hundreds of gold coins gleaming bright as the day they were minted.

With trembling hands they grabbed several and surfaced. No Spanish treasure this, they were American gold coins dated 1857. The boys looked at each other and let out a wild yell. That afternoon when they waded ashore, their goody bags weren't bulging from bugs but from handfuls of heavy gold coins, most of them twenty-dollar gold pieces.

Once again the coins were found on submerged land within the state's territorial boundary and they legally belonged to the state of Florida.

What to do?

Wisely, James Gordy's father contacted Florida authorities about his son's find and in due course the state issued the Gordy's a lease to salvage the coins. For the next three months the boys went out in their boat daily with sandwiches and soda, anchored in 12 feet of water and brought up thousands of gold coins. When they decided they had found them all, it was time to square up with the state. The boys had recovered a total of 3,182 gold coins with a rare coin value then of \$230,000. In accordance with the contract, they kept 75 percent of the find and Florida received 25 percent, a portion of which went on museum display.

Curious as to how the coins got to where they were found, state underwater archaeologist Carl J. Clausen began questioning historians. One clue led to another and eventually his research uncovered the full story from our National Archives in Washington, D.C.

Clausen learned that during the Third Seminole Indian War, paymaster Major Jeremiah Dashiell was bringing up a payroll of \$23,000 in gold to the army troops garrisoned at Fort Capron near present day Fort Pierce. As the paymaster's longboat attempted to negotiate rough waters in the inlet opposite the fort, it capsized and the payroll was lost. Strong currents and quicksands were reported to have prevented its recovery.

In time sand closed the inlet, the currents ceased and the coins lay where they were dropped on the limestone bottom awaiting the day when someone like Albert Ashly and James Gordy would look down through the 12 feet of water and see them. No one did for 106 years!

In a historical footnote to the above,

Three-inch gold dragon pendant and 11-foot chain were found on the beach and deemed by law to be "treasure trove." It was finders keepers and the items were auctioned for \$50,000.





The author examines the remaining timbers of the Spanish treasure ship, San Jose which sank in 1733 off Islamorada in the Florida Keys.

after paymaster Major Dashiell's unfortunate loss, he went back to the mint and collected the same amount of gold, with the intention of paying off Fort Capron. But once again misfortune struck. The payroll was hijacked by robbers at Palatka. History records that Major Dashiell never made any of the losses good. At the end of the Civil War when he applied for retirement, the unlucky paymaster's request was denied. It is not known whether or not the poor guys at Fort Capron ever got paid.

If you think it rare that treasure is found along Florida's east coast, think again. The east coast, especially from Canaveral south into the keys is the site of an extensive paralleling barrier reef, one that has snared ships for centuries—especially fleets of Spanish treasure ships trying to avoid these rocky hazards at the height of hurricanes. Considering that a single such ship carried literally tons of silver coins and specie, and that this cargo was scattered far and wide over the reefs that tore the bottoms from the foundering fleet, it is easy to understand why certain areas get more than casual attention from people waving high-priced super-sensitive metal detectors over the sand.

Beachcombers near Sebastian Inlet skipped misshapen corroded pieces of metal back into the sea for decades until Kip Wagner came along with his metal detector and discovered they were pieces of eight. Such clues led him to the off-shore wrecks and a fortune of recovered treasure.

Today, salvors are still working those sites. Some of the recovery areas extend along the beach for over a mile in some places. Those in the know profit from severe northern storms which howl down the winter coast and scour them clean,

lowering the beach by several inches. Even before the gales subside, coinshooters thicker than fleas on a mongrel's back are shouldering each other aside to search for goodies. How much is actually being found is anyone's guess because anything found on a Florida beach is considered "treasure trove." In other words, finders keepers. Nobody can claim it but the finder. No strings attached, no divisions, and nothing needed but one's own stubborn persistence with a touch of good luck.

Ron Hampton of Tampa has had such luck. So much so that he owns a half dozen of the top of the line metal detectors for above and below water use and a second business he has built around his many finds. Two Thanksgivings ago, Hampton was swinging his White's Electronic PI 1000 pulse induction detector along the water's edge opposite a salvage site known as Corrigan's Wreck, when the detector stepped up the frequency of signal in Hampton's earphone. Excitedly digging into the target area under six inches of sand, the happy hunter recovered an inch-long, solid gold locket. On its back was an inscription celebrating a Spanish saint born in the 1500s and dying in the 1600s. On its face was a tiny glass window. Behind it stood an even tinier ivory statue of the saint. The reliquary is valued at over \$10,000. A fair enough return for beachcombing a couple hours. But then that artifact had been lying around that beach for 269 years waiting for someone to find it.

Less than a mile up the coast, Hampton's buddy swung his White's detector along the base of a dune and uncovered a small emerald studded crucifix. Other coinshooters that day were seen leaving the beach with a cannon in a wheelbar-

row. Still others pocketed several thousand dollars worth of heavily sulfured pieces of eight with possibly a gold coin or two thrown in for good measure. The most valuable find from the 1715 fleet treasure salvage was an 11-foot-long, intricately floral designed solid gold chain attached to an elaborate three-inch-long dragon pendant that was a combination whistle, ear scoop and toothpick—the whole thing was found on the beach opposite one of the wreck sites. The tipoff to another of the shipwrecks south of Fort Pierce was the discovery of several unique gold coins on the beach. They were perfectly struck 8-escudo "royals" which are so rare that today their value ranges from \$20,000 to \$40,000 apiece.

Since the treasure of this fleet was scattered widely along this coast, searchers will probably still be finding valuable traces of it for centuries to come. But one must remember that whatever is found on land, other than on state or federal property, is treasure trove belonging to the finder. And everything found from the high tide mark out to international waters (three miles in the Atlantic; about 10 miles in the Gulf) including shipwrecks and artifacts, is off limits to the casual collector without the proper permit or salvage contract issued by the State of Florida. Sport divers are free to visit the old shipwreck sites to look or photograph but not to disturb anything. Such sites are part of our historical heritage and as such should be preserved as intact as possible. But by the very nature of their condition, shipwreck artifacts are so widely scattered that sooner or later chance finds do occur. When they do, how will Florida authorities react?

"It is not state policy, nor has it been the practice of the agency, to confiscate material accidentally found on state lands or to prosecute the finder," says James J. Miller, Chief of the Bureau of Archaeological Research at Florida's Division of Archives and History. "Rather, we are interested in learning about historically important finds and would hope to discuss with the finders ways that the state may acquire or exhibit important artifacts (such as) ships' rigging or structure, tools, weapons, coins, and oriental or Spanish pottery This policy is not intended in any way to encourage recovery of archaeological material from shipwrecks or other sites," stresses Miller. "Divers who do find artifacts they believe are significant should call the Bureau of Archaeological Research in Tallahassee at (904) 487-2333."

Those interested in learning more about the history and locations of over 50 historical shipwreck sites along Florida's southeast coast will find them detailed on three shipwreck charts available from Spyglass Publications, P.O. Box 485, Chatahoochee, FL 32324 for \$15.95 including postage and handling. **S**



Someone battered on the door so hard that I nearly swallowed the eraser I was chewing on. A short but panicked sprint down the hall revealed only Red Brutula standing serenely on the stoop. He appeared as mischievous as a healthy man of sixty-odd could. Over his skinny frame he wore clean Oshgosh coveralls, a white, stretched-out Fruit-of-the-Loom undershirt with a couple of mustard stains,

Sampson Post is a writer and professional boat skipper living in Costa Mesa, CA.

and a three-day stubble of beard.

When he saw I wasn't laughing at his little prank, Red looked crestfallen. Shoot, then I felt bad.

Against my better judgment, I held the door open and stood aside. "Come on in," I said and ushered Red into my wife's clean kitchen. I felt not a little put upon since I, for one, still had work to do. One o'clock in the afternoon was not my quitting time.

"Help yourself to whatever's in the refrigerator Red," I hedged. "But I got to

make tracks. I'm on deadline."

I sprinted toward the back of the house, in the hopes I might escape him but Red was pretty fast on his feet for an old duff. He snagged a six-pack of Stroh's out of the icebox and was two steps behind me before I'd made 10 paces.

"Deadline, huh? What you writin'?" He shoved with me into my study and slammed the door and nonchalantly leaned his back against its enamel surface. "Why don't you write down some of the stories I tell you, huh? People need to hear the

Dirt Watson's Deep Dive

truth once in a while."

"The stories you tell? Hal! I wouldn't exactly term . . ."

"Now watch your tongue, you pup," he interrupted. "Did I ever tell you about Dirt Watson's deep dive? That's a story you ought to send to your editor 'stead of that hogwash you're tapping out there. Sit your behind down. I'll tell you something worth knowin'."

With one hand, Red shoved me down into the chair from which I'd half risen and slid the other hand stealthily behind himself to lock the door. He settled himself down as comfortable as a fellow could expect while manning a barricade.

"Now up until the time of" Dirt Watson made the deep dive I'm about to tell you about, he was a happy man who enjoyed the good things in life. He wasn't all so confused about what's so damn "important" in life by these cursed modern times." He pointed accusingly at my word processor across the room. "And putt-tui, on those, too. Hear me? Dirt was the happiest man I knew."

"We nicknamed him Dirt 'cause he never washed, but his personal sanitation didn't keep him from having the respect of every right-thinking person in Avalon. See, it was his philosophy about things which put him a jump ahead of most of us and Dirt was about as wise as ol' Gutma Buddha in that respect.

Dirt was a rich man by inheritance, but he figured the path to material happiness was not in owning a bunch of expensive cars and fast boats or a closet full of ascots. Hell, that only seemed to earn envy from his friends and high taxes. Yet then again, sack cloth and ashes wasn't such a celebration either.

Well, ol' Dirt worked out for himself the perfect compromise: he never denied himself a solitary thing he wanted, but at the same time he never once purchased an item if he thought another sane person would look twice at it either.

If ol' Dirt went shopping for a car, he'd commence in the Mercedes showroom, and go on to test drive Cadillacs and all them other high-buck cars—but just for entertainment's sake. His mind was already made up. On every single occasion 'long as I know him. The car he'd bring home would be a '61 Plymouth Fury that had two hundred thousand miles on the odometer and sawdust pounded into the transmission just to keep the racket down.

For the same reasons, if Dirt wanted a boat, he bought a derelict scow. I mean some rust-bucket fishboat with leaky seams, or a sailboat that had been sunk and raised so often its owner had give up and put anti-fouling, bottom paint both in-

side and out.

Boats were important to Dirt, too, because he lived on them over in Avalon Harbor. Only problem was they had a real tendency to sink—sometimes at some awful in-op-por-tune times, too.

"Well, one particular craft in Dirt's long chain of boats was a spoon-billed, bow-heavy, rusty-steel commercial abalone boat, the *Uncle Walt*, that been owned by just about every ab diver in town at one time or another. She was so old and beat the guys in the Chi Chi Club swore that only 25 years of built up diesel slime held her together. That and some dried paint maybe, and most of that was 'bout rusted off.

She had a little pilot house amidship which somebody had knocked together with pine two-by-fours and indoor-grade plywood which by now, had the layers aflakin' off like pulpy pages of a book. *Uncle Walt* had all the fine, proud lines of a lettuce crate that been left out in the field too long.

As far as speed goes, I saw her once make a good three knots through the water—and there was only a six-knot current pushing behind her. Shoving into the weather though, I suspect, she'd have run a mile slow.

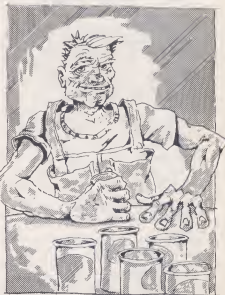
Yet, despite all her flaws, Dirt loved *Uncle Walt*. Man, he was always pamperrin' on her and hangin' little lace curtains and such. He never did anything she really needed, of course, because that would only lower her value in his own eyes. But I think he loved that rusty old scow better than any boat he ever owned. He was plain discouraged when she sunk.

Uncle Walt didn't go so peaceable either like some of Dirt's boats. One night 'long about three in the morning, *Uncle Walt* gave a squeak and a pop and the soul surviving V-8 engine fell right out of her. Not even a splash or a slurp or glug gave warning to her sleeping owner. Hell no! *Uncle Walt* was already 50 deep and hell bent for the bottom before Dirt even knew his sheets were wet.

I mean to tell you, too, Dirt Watson was aroarin' down toward Davy Jones all of a sudden like a damn airplane crash—Dirt was aholdin' his nose and blowin' his ears, with his cheeks bulgin' out and his eyes poppin' like grapefruits. First, his sheets came aflappin' up and he'd flail em' back down. Then his pots and pans come aouncin' into bed with him and beat him senseless. Yet all of a sudden that nonsense came to a quick stop because ol' *Uncle Walt* struck bottom.

Dirt and all his possessions finally floated free. In fact, he'd still probably be

Red Brutula spins another tale of high adventure.



By Sampson Post

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imitating a soppy blanket on the ocean bottom even now except his foam mattress was leaving for the surface right then and he just happened to be clinging to it.

It wasn't all that rare of a thing in Avalon to see Dirt Watson come breast stroking to shore at midnight. But it was a bit out of the norm to see him come paddling in on a mattress, naked except for a pair of Jockey shorts.

Well, a couple of us were standing on the pier at the moment trying to sober up enough to navigate the whole four blocks home. Frogmouth Mary was there. She's a huge mountain of a woman with hair like mattress ticking, and a voice like an air horn.

"Dirt, you old skin flint," she berates him soon as he comes under the light. "You cheap so and so. Why the hell don't you get some pants?"

Dirt doesn't answer. He just keeps paddling straight ahead; strokes dead into a pier piling and falls off his mattress. He'd have drowned there too if Mary hadn't finally jumped in after the guy—but thanks only to my quick-thinking persuasion.

After that came a long night of pumping water out of Dirt and pouring coffee back in. Try as we might, there was just no way we could talk him out of salvaging *Uncle Walt* the next morning. Dirt wanted that boat back something awful and he wasn't takin' anybody's advice. That seemed too bad to me since Dirt's concept of diving probably wasn't much more than a couple of centuries out of date.

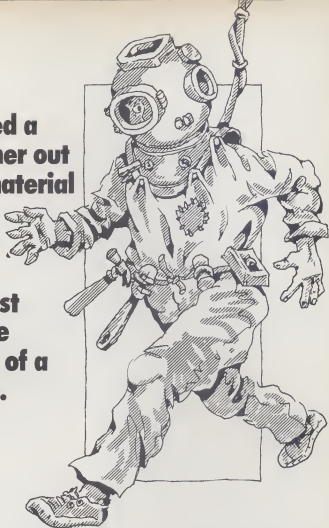
Dirt stitched a suit together out of some material which appeared to have done its last duty as the inner tube of a tractor tire. His lead weights were strung on a fan belt. He didn't even have a mask, but a diving helmet.

Watching him load his gear in such a bonehead way got me kinda aggitated and I wandered over and offered to run his skiff. All the way out to the anchorage, I felt it my duty to coach him in all the secrets of nitrogen and deep diving that I had accumulated over the years. I held him spellbound for the entire half hour trip—even though sometimes he'd fall asleep or peruse the text of a chewing gum wrapper for long minutes.

We anchored the skiff and I helped him suit up. I made it my job to watch the small compressor that pumped air down to him while, at the same time, keep his air hose from tangling as it streamed out. Once I plunked Dirt in, that hose ran out as if it were attached to a speed boat. I could barely keep up and sometimes didn't. It must have put a good bit of extra length in ol' Dirt's neck, too, judgin' by his velocity. Eventually though, the hose went slack. I took the tension up and could feel him awaken! across the bottom.

I don't imagine Dirt walked more than a mile before he found *Uncle Walt*, and

Dirt stitched a suit together out of some material which appeared to have done its last duty as the inner tube of a tractor tire.



none of it in a straight line. I gave him every inch of anchor line aboard the skiff and then tied my pants and shirt together into a makeshift rope just to give him extra distance.

Suddenly, behind me, I hear the compressor start doing rpm's like a steam locomotive. A few seconds later, the bubbles at the surface stop and that means the air must be agoin' into something down there on the bottom.

I glance at my watch after it runs 20 minutes, then again at 30 minutes. I'm gettin' nervous, let me tell you, because I figure there must by now be about a thousand cubic feet of air all loaded into *Uncle Walt* down there just waitin' to bust lose. The little compressor's chewin' and gagin', crankin' and aroarin'. I peer over the side of the skiff desperately lookin' for Dirt just in time to see somethin' way down deep start a comin' up.

Its a boat all right and it's big, it's black and it's comin' straight up underneath my skiff. I kick over the outboard and slam the throttle down. I mean, what's comin' up is huge and risin' fast. Suddenly she busts the surface with an explosion that coulda' leveled Pompeii.

I didn't remember *Uncle Walt* being a 190 feet long before she went down. She grow'd quite a bit down there by God and I was sittin' right atop 'er.

She had huge smoke stacks now, and a conning tower, and a rotary gun turret on the bow, and in many ways looked sorta different.

It was cold and breezy up there where I was perched and Dirt looked like an ant when he finally hit the surface.

His eyes grew wide as he stared up at his new home. Seaweed clung everywhere, rust had eaten about through most of the deck plates and the ship lay there like a bloated fish. Dirt lifted up his faceplate in awe.

"Wrong boat," I called down. "You damn fool, you brought up the wrong boat."

Dirt rubbed his eyes and blinked. His mouth fell open as he stared up at the new *Uncle Walt*.

"No, it's the right boat," he whispered as if in a trance. "A perfect boat. A dream boat."

"Dream boat my—!" I ran my hand over the metal conning tower and my palm came away orange with rust. "I wouldn't own this thing on a bet!"

"I know," says Dirt. "It's perfect."

I stared at him. He stared at his new home. It all seemed sad, somehow.

From where I sat atop the wreck, the air was as rarefied and heady as good cheap wine. It took me two hours to climb down.

S

As I waded ashore in my wet suit, holding a pair of fins in one hand and an 18-inch trout and fly rod in the other hand, an elderly man gaped at me with open-mouthed astonishment.

"My God!" he exclaimed, "I've been fishing for over 70 years but I've never seen a sight like you."

About an hour earlier I had loaded snorkeling gear into my van and drove from Orting, Washington, toward Mt. Rainier for about 10 minutes until I reached the shores of Kapowsin Lake.

My decision to go snorkel trolling had been prompted by a rainy October day and the need for some exercise. During good weather, I usually run several times a week at the Orting High School track. Regular exercise has enabled me to continue diving in Puget Sound's cold water for nearly 30 years. On rainy days, I ordinarily use an indoor exercise bike but once in a while I head for one of several nearby lakes or streams.

On this particular day, the rain was beating down hard as I started kicking toward the opposite shore almost a half mile away. I really didn't expect to get anything except exercise but I stripped out line until a small spinner and worm

Jack Watson is an avid diver who worked for the American Red Cross for many years as a water safety instructor and YMCA diving instructor. Jack lives in the shadow of Mount Rainier.

Combine snorkeling and fishing for exercise and perhaps a nice trout.



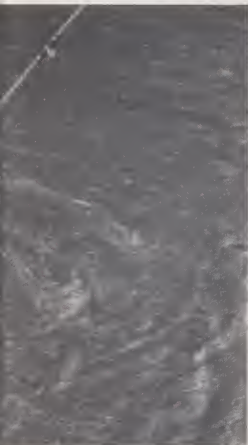
By Jack Watson

An Added Dimension

were trolling behind me just under the surface and approximately 50 yards beyond my fins. Kapowsin Lake is so full of submerged logs and snags that trolling deep is all but impossible.

Looking down through my face mask, I could see nothing but black water so halfway across I rolled over and continued kicking on my back. Suddenly the fly rod was nearly jerked out of my hands. Peering through a rain drenched mask, I saw a large fish slashing and thrashing the surface behind me. After a long run and several spectacular leaps, the trout started coming my way but offered stubborn resistance as I slowly reeled in line.

I kept kicking toward shore until I was able to stand in shallow water. From there, I played the fish for several minutes, trying not to put a great deal of strain on the four-pound test leader. Finally the trout rolled exhausted on its side. Fortunately there was a cleared area nearby where I was able to slide the fish ashore. Of course I awkwardly tripped over my fins scrambling after the trout but I finally managed to get a firm grip through a gill opening before it could flop back into the



water. I gave it a whack on the head with a rock so it wouldn't continue to struggle during the snorkel trip back across the lake. Although I could have put the fish on a stringer fastened to my weight belt, I decided to tow the fish with one hand and not troll for another fish while I kicked back to the parked van. This large trout would provide a substantial meal and I was more than satisfied. In fact, I was feeling a happy, warm glow for getting more than just exercise in such nasty weather.

I hadn't expected an audience when I waded ashore, but have to admit that the astonishment and admiration of the old gentleman, when he saw the size of the fish, did add to the glow I was feeling. He stayed out in the rain for several minutes asking perceptive questions about my equipment and diving experiences before he returned to his pickup truck. Obviously he was fascinated and somewhat regretful that he had never taken up diving.

On the drive home, I thought about some of the other satisfying and downright fun times that my snorkeling gear had afforded me, not only in salt water,

but also many times in lakes and streams.

One of the most memorable and unusual experiences happened on my favorite trout stream, Yellowjacket Creek. This beautiful stream is located in Gifford Pinchot National Forest about halfway between Mt. Rainier and Mt. St. Helens.

My wife June and I had hiked down into a deep canyon of Yellowjacket Creek which we fondly refer to as "Paradise Canyon." Years before an old friend had told me how to reach this paradise by means of an obscure trail known to only a few people. After traveling upstream for a quarter of a mile, we were blocked by narrowing rock walls and a deep pool below a waterfall. While I unloaded my wet suit and snorkeling gear from a backpack, June started fishing downstream.

With my wet suit on, I was able to comfortably swim along the cold surface of the long pool. Through my face mask, I could clearly see several nice trout holding along the bottom about 15 feet below me.

I was carrying a fly rod rigged with a streamer fly but I did not bother to dangle the fly in front of the fish as I knew from previous experience that wary trout are not apt to strike at any lure when they can see me at the surface. In fact, they become very spooky.

At one side of the waterfall, which was only five or six feet high, I removed my fins and climbed up some rocks to the pool above the fall. Crouching low behind a large boulder at the edge of the water, I cast the wet fly into this upper pool and let it drift toward the bottom with the current. Then I began stripping the line back in short jerks so the fly mimicked the action of a small, darting baitfish.

A few moments later I was delighted to have the rod bent almost double against the surge of a hefty trout. With considerable satisfaction, I thought to myself, "I'm probably the only human that has ever reached this spot!" However, I was in for a surprise.

When I glanced upstream to see where

I could land the fish, I saw a husky young man scrambling down the sheer canyon wall with the aid of a long rope. He was soon followed by two other young men. All three had fishing poles strapped to their backs. When they looked downstream and saw me standing there in a wet suit and holding a foot-long trout, they shook their heads and looked at each other with obvious bewilderment. I couldn't hear their comments above the noise of the waterfall, but I knew they were wondering how the hell I got there. I hand-signalized that I had come upstream by swimming. They grinned, shook their heads some more, and then started fishing away from me.

After catching another rainbow about the same size as the first one, I snorkeled back through the pool below the fall. Eventually I caught up with June and she happily showed me a couple of trout almost as big as mine. When I told her about the three young men who had scaled down the canyon wall, she laughed and commented, "What a shock it must have been for them to see a crazy skin diver up a creek!"

When Mt. St. Helens erupted on May 18, 1980, many square miles of trees were blasted to the ground and the roads leading into the surrounding area were closed to public access, including the one to Yellowjacket Creek.

About a year after the mountain blew, June and I drove to the Randle Ranger Station located just outside the closed zone. We learned from the rangers that Yellowjacket Creek had fortunately been far enough from the mountain so no trees had been knocked down along its banks. However, the rangers speculated that the heavy fallout of ash and pumice may have adversely affected the wild trout.

Finally in the summer of 1982, the closed area around Mt. St. Helens was opened so we were soon on our way to Yellowjacket. We were shocked by the changes we saw in the former pristine stream. The once sparkling clear water was now murky and most of the former deep holes were shallow and silted with a mixture of grey ash and cream colored pumice. Three to four inches of ash covered the ground but the streamside plants were growing right through this. There also were favorable signs indicating the frequent rainstorms of the Northwest were starting to dissipate and wash away the ash. Compared to the annihilation of Spirit Lake and the awesome destruction along the Toutle River, there was little physical damage near Yellowjacket Creek. Therefore we were optimistic about the trout surviving.



Photo by William Good

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We fished a considerable section of Yellowjacket which used to swarm with wild rainbows but the water seemed utterly devoid of aquatic life. Obviously the trout population had been decimated by fallout.

We were about to sadly give up fishing when June gave a whoop of delight. Her fly rod was doubled over and pulsating. For several minutes, she skillfully played a fish which was not leaping out of the water like most rainbows but it did fight vigorously. Finally she was able to slide a 12-inch rainbow onto a sandbar which was thickly speckled with pumice. She would have released the fish but it was hooked deep and bleeding. We examined the trout thoroughly but could find no abnormalities, other than the fact it was somewhat lighter in color than previous Yellowjacket rainbows we had caught.

We quit fishing and fervently hoped there were a few other surviving trout that might eventually replenish the population. The rest of that season we deliberately stayed away from Yellowjacket and I managed to catch a few trout in a high mountain lake where snorkeling was fun because of phenomenal visibility.

The following summer we found the rainbows were making a comeback in Yellowjacket Creek. Fish were certainly not as abundant as before but some were growing big, probably because of less competition for food.

A year later and more than four years after Mt. St. Helens blew her top, we returned to the Paradise Canyon of Yellowjacket. Again I snorkeled through the deep pool below the waterfall and was pleased to note several trout of various sizes finning near the bottom.

After I climbed above the fall, I half expected to see some vigorous young men come scaling down the canyon wall again. I was not disappointed however, to have the place to myself.

After catching a couple of hard fighting fish, including a 16-inch, I snorkeled back through the pool to where I had stashed my clothes in the backpack.

That day June and I fished with great success. We had a grand time but we carefully released most of the trout we hooked to assure the proliferation of the canyon rainbows.

When we reached the top of the steep canyon trail, June and I rested for a while and discussed our seven wonderful grandchildren. Someday we would give each of them the opportunity to follow our footprints along Paradise Canyon. But, we would carefully explain to them and their parents why they should limit the number of fish taken out of that area. Mt. St. Helens had nearly wiped out the wild rainbows in Yellowjacket Creek. We certainly did not want our grandchildren to ultimately be responsible for such a catastrophe in our Paradise Canyon.

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Who needs a titanium knife? Who needs a Porsche, a Rolex, or a Hasselblad? None of these expensive items are essentials, but the people who buy them can come up with a strong argument why they made the purchase. You will have to come up with your own answers for the car, the watch, and the camera. This article will supply the rationale for the knives.

Titanium is expensive, but its dull gray finish isn't especially attractive, somewhat like plastic trying to masquerade as metal. It certainly isn't rare. But titanium is a miracle metal and has become the material of choice in many high-tech applications. It is used in jet and rocket engines, as well as in structural supports for aircraft. The pressure hull of the research submersible, *Alvin*, which can take scientists two miles below the ocean's surface, is made of titanium. Nikon has used it for years in camera shutters; today the body of their top of the line camera is made of it. Porsche uses it in the connecting rods of their ultimate car, the 959. Yet few people besides metallurgists know much about titanium. It is stronger than stainless steel but weighs about half as much, is virtually corrosion proof, and anti-magnetic. And it costs a bundle, despite the fact it is the fourth most abundant metallic element in the earth's crust.

Usually we associate high cost with rarity, but titanium is an exception to the rule. For a metal to be mined economically, large quantities should be concentrated in one area. Titanium is diffused throughout the earth's crust, and is never found in its pure state. Extraction is difficult and costly, as is the manufacturing process. This is a hard material to work with. It wasn't produced commercially until 1948, and for a long time the supply was confined exclusively to military uses. Production today is centered primarily in the United States, Japan, and the USSR.

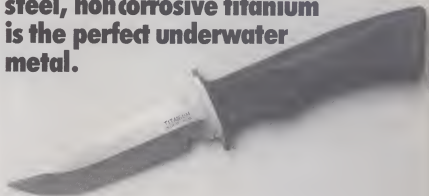
The same properties which make titanium so desirable for defense and aerospace purposes also make it ideal for diving applications. People and the elements are incredibly tough on diving gear, so a material that is light, strong, and corrosion resistant should be perfect. Yet the diving industry has been slow to use it, until now. SCUBAPRO recently introduced four exciting new products made from titanium: a watch, two diver's knives, and a pocket knife. None are intended for the diver on a tight budget. Instead, they are aimed at the diver who has everything, and is looking for the ultimate tool or accessory, the same person who would buy that Porsche or Rolex or Hasselblad.

Few objects are made of pure titanium,

A scuba instructor for 23 years, Eric Hanauer is the diving officer at California State University, Fullerton. His articles and photographs appear regularly in national magazines as well as those in foreign countries.

Titanium...

Lighter and tougher than stainless steel, noncorrosive titanium is the perfect underwater metal.



By Eric Hanauer

THE ULTIMATE IN DIVING KNIVES

and the SCUBAPRO knives are no exception. They are made in Japan from a titanium alloy, called Ti-6Al-4V. That's metallurgists' shorthand for an alloy composed of titanium, aluminum, and vanadium. This material is stronger, more heat-resistant, and more expensive than pure titanium.

Until now, the ideal diver's knife was always a compromise between sharpness and corrosion resistance. The process used to render stainless steel rust resistant results in a softer metal. Soft metal doesn't hold an edge very well. For many years, divers accepted knives that weren't really knives at all. They were pry bars, tools, and sometimes hacksaws. They

could also be used to spread mayonnaise on sandwiches between dives. The only thing they couldn't do well was cut.

But some divers needed a tool which could cut underwater. Spearfishermen needed it to cut a struggling fish. Others needed it for cutting lines, or nets, or entangling plants. The diving industry responded with knives made from a hardened stainless steel. These hold an edge much better than the older ones, but are very susceptible to rust and corrosion. Divers have to pamper these knives, washing them thoroughly and coating them with oil or silicone after every use. The blade must be sharpened frequently, and rust has to be removed by scrub-



SCUBAPRO Titanium Pocket Knife

bing with brass wool. (Steel wool transfers iron into the blade and actually accelerates rusting.) Since stainless steel is brittle, these knives couldn't be used as pry bars, because they would snap under the stress.

SCUBAPRO's titanium knives give you the best of both worlds: a sharp blade that doesn't have to be pampered. Try dipping your stainless steel knife in sea water every morning and evening, then storing it, wet, in its scabbard. Imagine what it would look like after a couple of weeks. That's exactly what the SCUBAPRO engineers did with their titanium knives, and they came out looking as though they had just come off the assembly line.

The diver's knife comes in two sizes: medium at 9 inches long with a 4½-inch blade, and large at 10¼ inches long with a 5½-inch blade. The price of the medium knife is \$120, while the large model costs \$130. The grip is made of a hard rubber compound, which fits the hand with its comfortable, non-slip surface. There is a hole in the grip for attaching a lanyard. Both blades have a serrated top edge for sawing, and an integrated line cutting notch on the lower edge. The medium one has a Bowie-type blade, while the large has a gentler curve. Both are thick and rugged, but extremely sharp. Which one you choose is strictly a matter of personal preference.

SCUBAPRO engineer Jim Dexter informed me that titanium won't snap under stress, but might bend. Therefore I did things with it that I would never do with a stainless steel knife, like prying scallops from between rocks. Hardened stainless steel isn't meant to be used as a crowbar, but such mistreatment didn't faze the titanium knife. Since the sample wasn't mine, I decided to test Jim's claim a bit further. Using the medium blade as a lever, I was able to lift a corner of a

refrigerator and an oven. The blade didn't bend a bit. It should stand up to any abuse a diver can dish out.

I did have a problem, however, on my initial test dive with the product. After cutting various materials from kelp to rope to fishing line with ease, I replaced the knife in its scabbard and returned to the boat. When my buddies asked about its performance, and I tried to pull it out to show them, the scabbard was empty. So was the feeling in the pit of my stomach. After all, the knives were only loaned for the purpose of this article. SCUBAPRO's executives don't mind damage to their gear during testing, but losing a \$130 item can make a writer look like a flake.

We had one tank left on board with 800 pounds of air in it, so I prevailed upon my friends to delay our departure while I made a desperate search of the area we had just dived. With less than 200 pounds remaining, I spotted it lying on a rock, in 50 feet of water. Now I know how Mel Fisher must have felt.

My mistake was in failing to test the locking device on the scabbard after replacing the knife. SCUBAPRO's plastic scabbard has a spring lock, which holds the knife hilt against a pair of tapered plastic tabs. When you place the knife in the scabbard, push it down hard, then try to pull it back out to make sure that it is locked in there securely. That will protect your investment and avoid repeating my mistake. As long as the knife is locked in its scabbard properly, there is no way it can fall out.

Removing the knife is a one-hand operation. Just push the release tab downward with your forefinger while holding the grip, then pull it away from your body while lifting it out.

The scabbard is made of black ABS plastic, with the logo and release tab in SCUBAPRO blue. The retaining spring is

beryllium copper, which will not rust. Unlike other hard plastic scabbards which dig into your leg, this one is contoured to fit without discomfort. There are wide slots, so it can be worn on a two-inch weight belt if the diver desires. The medium one can also be strapped to a console, or worn on the diver's arm. Straps are not supplied.

For topside use, SCUBAPRO has also introduced a titanium pocket knife, priced at \$80. Although it bears a slight resemblance to SCUBAPRO's stainless steel pocket knife, this is an entirely new design. Everything on it is made of titanium, except for the stainless steel spring. Folded, it is only 3½ inches long, and ¼-inch thick. When open, the blade adds only 2¾ inches to the length. A positive locking device holds the blade open until a release tab is pressed. The first impression is that this blade is really sharp. The next is that it is honed on only one side. This is true of the diving knives as well, and is one of the factors which make these titanium knives unique.

Most knife edges are ground to an angle of about 45 degrees. Usually, half the angle (about 22 degrees) is honed on one side and half on the other. On SCUBAPRO's knives, the entire 45-degree angle is honed on one side of the blade; the other is flat. The reason is that the surface of these knives is extremely hard, while the softer core remains ductile—it bends without breaking. Surface hardening is achieved through a process called nitriding, in which nitrogen is impregnated into the surface of the material. This is similar to carbon treatment for steel, and results in a surface as hard as 420 stainless steel.

With the surface hardened, the further the edge is honed beyond the outer layer, the softer the material and the less effectively it will hold that edge. By doing all the honing on one side, the hard surface continues all along the edge of the blade. When you sharpen your titanium knife, do it just as you would sharpen any quality blade, but do it only on one side.

No special care is required, other than washing the knife after diving. But despite the hardness of the metal, SCUBAPRO knives could display some slight surface scratches after a while. This is especially true if a pocket knife is constantly bashed against coins and keys while residing in the owner's pocket. Surface scratches are easily removed with crocus cloth, a lapping and polishing cloth commonly used in machine shops. This cloth is impregnated with a fine polish. Just rub your knife with the dry crocus cloth, and superficial scratches will disappear.

SCUBAPRO's titanium knives are a luxury item with a strong practical purpose. If that hard-to-please diver on your gift list appreciates precision tools, or if you do, look for them at your dive store. **S**

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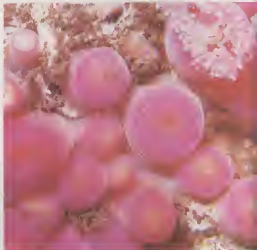
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Often encountered, but seldom considered, these unusual creatures are worthy of study.



Photos by Adam Zetter

Joni Dahlstrom

Some anemones, such as the one at top, secrete a substance to which rocks and shells stick. Stinging nematocysts are located in tentacles, left, which can be retracted at first sight of danger, as seen above

Divers generally consider themselves pretty well-acquainted with the subject of sea anemones, if only because they are always there. After all, practically everyone saw anemones on their first dive and their last dive, and most of the dives in between. Sea anemones seem to be everywhere, growing on rocks, burrowing in sand and floating on the surface of the water in dozens of shapes, sizes and colors. But, for all their common ways, sea anemones are still beautiful and fascinating animals.

It is no wonder sea anemones are one of the most frequently encountered animals a diver could shake an air hose at as they are found in every ocean of the world at depths ranging from the tidal zone to over 30,000 feet. Anemones are an extremely diverse group as well, with over one-thousand known species occupying practically every niche of the ocean realm.

The anemones most noticeable to divers are the colorful varieties living on reefs and submerged rocks, but many more species burrow into sand or mud and a few species float freely in the open ocean like jellyfish. Some burrowing anemones grow to over six feet in length and some species are five feet in diameter, while many species are only a few millimeters across.

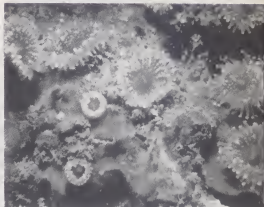
Sea anemones are members of the phylum cnidaria, their closest relatives are the hydroids, corals and jellyfish. The anemone has a relatively simple body structure, consisting of tentacles to capture food and a stomach cavity. Anemones' bodies are usually soft and squishy,

in a heavy surge. Burrowing anemones stay in one place by digging their bodies deep into the sand then swelling the buried tip into a large bulb that acts as an anchor. The genus *minyas* always float freely on the surface, with their mouths hanging downward, like a jellyfish.

In the anemone's tentacles there are stinging cells called nematocysts. These are the anemones' main line of defense and means of catching prey. The nematocyst is a poisonous cell used to paralyze small fish or animals that come near the anemone. The nematocysts also discourage some creatures from preying on anemones. Many anemones secrete a sticky substance that causes tiny rocks and broken bits of shell to stick to the soft parts of their bodies for camouflage and protection.

Anemones have no organs which even slightly resemble a brain or spinal column. What they do have is a nerve net that reaches over the surface of their entire body. The nerve net provides anemones with a basic awareness of the surrounding environment and it also gives them the ability to react to changes in their environment. For instance, they can move in a specific direction, feed selectively and they do not sting indiscriminately. Anemones may even be capable of associative learning.

At first glance, anemones appear to be immobile creatures living permanently affixed to a single rock or buried in a hole. Actually nearly all anemones are capable of moving from one area to another. Some species move with a slow somersault motion and others inch along moving their



Strawberry anemones, above, contain a natural phosphorescence

icious feeders. When hungry, they will try and eat just about anything offered to them, including rocks. Their digestive juices are incredibly powerful. An anemone can digest all of the meat on a chiton, (a mollusk known for its tough body tissue) in less than 15 minutes and spit out perfectly cleaned shells.

Anemones reproduce in several different ways; through basal fragmentation, longitudinal fission and sexual reproduction. Longitudinal fission and basal fragmentation are asexual forms of reproduction. When using longitudinal fission, the anemone divides in half along the full length of its body and separates into two complete anemones. Basal fragmentation occurs when the anemone's base breaks off into smaller pieces and grows into complete anemones. Sperm and eggs are expelled through the anemone's mouth during sexual reproduction. Sperm is also drawn into the stomach cavity where it can fertilize the eggs that wait in brood pits, around the base of a female anemone. After the young have reached the right size, the pits break off in a form of basal fragmentation leaving the young anemones on their own.

Many species can use all three of these reproduction methods, depending on which one is the most advantageous at a given time. The proof of this is in large groups of anemones that are all of the same sex and exactly the same coloring. At times you have probably seen groups of strawberry anemones or metridiums with an unusual color mutation and they all look like carbon copies. These anemones are the result of asexual reproduction from a common parent. Even though these species are both capable of sexual

Anemones

A CLOSER LOOK

They take on a given shape through hydrostatic pressure, filling their bodies with water and then contracting different sets of muscles to change or maintain their shape, the way a blown up balloon changes shape when squeezed.

Those anemones which live on rocky surfaces have a pedal disk that prevents them from being torn off of the rock even

pedal disk slowly across the rocks. All anemones use hydrostatic pressure to change the shapes of their bodies and propel themselves through the water.

With so many species of anemones occupying such a wide variety of habitats, it is practically impossible to say that anemones feed on any one item. Many of the reef dwelling varieties frequently encountered by divers are primarily crustacean feeders. Other species feed strictly on microorganisms or fish. However, one thing is certain, all anemones are voracious

The writing/photography team of Joni Dahlstrom and Adam Zetter is based in Santa Barbara, CA. This is their first contribution to SCUBAPRO Diving & Snorkeling.



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reproduction, there are times when they favor asexual methods.

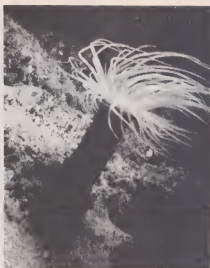
No one knows exactly how long sea anemones live, but it is definitely a very long time. A research biologist collected a group of mature great green anemones from a tidepool and took them back to the university research center, where they were catalogued and cared for. These anemones lived at the center for 80 years. In the end, their death was brought on not by old age, but by the inexperience of a new keeper who cared for them improperly. With proper care the anemones may have lived for another century or more.

Anemones form close symbiotic relationships with a number of unrelated species. Metridium anemones are found on the backs of kelp crabs; cleaner shrimp hide in their tentacles and everyone is familiar with clown fish that live unharmed and safe from the poison nematocysts of an anemone. The clown fish have a selective immunity as they are generally immune only to the poison of the anemone that is their host. If they travel to another anemone, they are at a high risk of being dinner. Tiny nudibranchs gain a defensive mechanism by feeding on anemones. They eat an anemone's poison tentacles without digesting the nematocyst. The nematocyst remains in the nudibranch's body where it will sting any predator that tries to attack. And, the bright green color, so familiar in shallow-water great green anemones, is actually the result of algae that live in the anemone's body tissues. Great green anemones found in deeper water are dull muddy green.

A surprising relationship exists between the anemone *Adamsia Palladia* and the hermit crab, *Euparagus Prideauxi*. This species of hermit crab and anemone are never found apart; when the hermit crab outgrows its shell it transfers the anemone from the old shell to the new one. The same crab and anemone may remain together for their entire lives.

Anemones that live in colonies or groups have a greater resistance to chemicals or poisons than a single anemone by itself. Apparently, the slime on the anemones' bodies contains substances like antibodies, and this substance can be transferred from one anemone to the next by physical contact. When an anemone develops a resistance to a poison or disease, it not only protects itself, but it can also transfer the resistance to other anemones in the same area and even to entirely unrelated creatures that live in the same location. The ability to protect an entire reef from oxygen poisoning, as when the tide goes out, may be the ultimate form of symbiosis.

There is far more to anemones than first meets the eye. As divers, who for the most part seek the spectacular, we sometimes overlook the truly amazing world that is



Anemones lived at a research center for 80 years.

spread out before us. Anemones are beautiful photographic subjects and a vital part of the ocean's ecosystem. **\$**

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By Nick Fain

Extending the Northeast Season



**The
best beach
diving
begins
long after
the
summer
ends.**

I was awakened by a gentle touch on my shoulder. There was a faint odor of neoprene. I opened my eyes, and standing before me was . . . MY DRYSUIT! Neoprene gets very restless when not submerged regularly in salt water. The ice dive in February was only a tease. On this cold March morning, my drysuit gave me the message: Frostlines be damned—it was TIME TO GO DIVING!

Two days later my dive buddy (who grew up on Lake Superior and was used to year-round diving) and I were motoring happily out of New York City toward the frosty shores of Jamestown, Rhode Island. My drysuit was singing camp songs in the trunk.

As we crossed the Rhode Island bor-



der, I noted the large icicles dripping from every overhang. My buddy explained this meant the "vis" would be astounding.

Jamestown, at the southern end of Conanicut Island is considered by non-divers to be the quiet gateway to Newport. To men and women of the rubber suit fellowship, it's a mecca for ocean-starved shore divers. Only minutes away at Beavertail Point was a profusion of marine life yearning to be photographed.

Beavertail State Park is open all year to tourists. Visitors are urged not to feed or molest its main attraction: DIVERS. The long rocky point can be dived on both sides, as tides and sea conditions permit. Parking is available at a number of dive sites. Entry points are chosen by how far you are willing to walk in full gear.

When we arrived, a few people were sitting in their cars with the heaters on. I expected to draw some attention as we climbed bravely into our drysuits on that wintery spring day. Before long, however, we were surprised to see two couples exiting the water in wetsuits! They were followed by another group at the next cove. One of the women noted cheerfully as she passed, that "the vis was up a notch since December!" It was clear that we weren't the only northeast divers who enjoyed more than a June-September dive season.

We quietly stowed our machismo in the trunk and sheepishly finished donning our paraphernalia. We trundled toward the entry point as sweat began to form in our arctic wear. It would actually be a relief to enter the 36-degree water. After a remarkably easy shore entry we descended. At about 275 pounds, including self, tank, weights and camera, I amazed a small flounder by becoming weightless.

It was immediately showtime! Bright sunshine lit the winding "trail" we follow-

ed. Bordered by kelp and large boulders alive with starfish, crabs, sponges and mollusks, it was a colorful pantomime of marine life on parade. A small blood starfish sat on a length of ribbon kelp like a tiny man in a dunce cap. Other starfish were holding hands or dining out on tasty blue mussels. A young lobster came out of his hole in broad daylight to see what all the rumpus was.

We followed a southwest compass heading and meandered along slowly. I was feeling very warm and content while taking in the show. There was no reason to rush the dive. The key was to keep a sharp eye out for the more elusive attractions. Exploring the rocks and crevices carefully, we encountered almost as much color as on a Caribbean reef. Since non-resident divers are not permitted to take lobsters in Rhode Island, we were spared the duty of filling catch bags. We could concentrate on the cornucopia of sea life there for us to admire, touch and photograph. The area offers an abundance of subjects, particularly for the macro photographer.

The panorama of the New England waters is subtle, and easily appreciated even by novice divers. Visibility can range from five feet, during a plankton bloom, to well over 30 feet in the colder months. Visibility becomes less of a factor when a diver develops an inquisitive and discerning eye. It doesn't take a marine biologist to be enthralled by a sheer rock wall covered with brilliant red and orange frilled anemones billowing in a gentle surge. Most of the local marine life is amazingly tolerant of the curious bubble blowers. You can actually pet a skate before he flutters away, or hold and stroke a colorful sea raven (avoiding the dorsal spines and mouth). These northeastern shores are rich with undersea species that

surely evolved just to be captured on Kodachrome.

Amazingly, faith in our compasses brought us remarkably close to our entry point, sparing us the adventure of rock climbing in full scuba. Egress is a fundamental consideration when planning a shore dive. Within my drysuit, the dive in the invigorating water was cozier and eminently more enjoyable than watching



Cousteau reruns in the living room. The many wetsuit divers we encountered that weekend seemed to feel the same way, evidenced by their smiles as they left the water—blue lips notwithstanding. Two weeks later the water would jump to a balmy 40 degrees and continue toward near boiling in the high 60's by late fall. A full 1/4-inch wetsuit with cold water hood and gloves will keep you "in the comfort zone" long enough to enjoy a good dive.

A three-minute drive from the diveshop in Jamestown took us to Fort Wetherill State Park for our night dive. The small protected cove is presently my favorite shore dive. The dramatic underwater terrain is best scouted during the day so a simple course can be plotted for your night dive. Although Wetherill is a hot spot for Saturday night divers during the summer, we only met two local lobster divers that night. They were on their way to "the Dumpings"—a shallow site nearby which is a good alternative when offshore winds make Wetherill or Beavertail undivable.

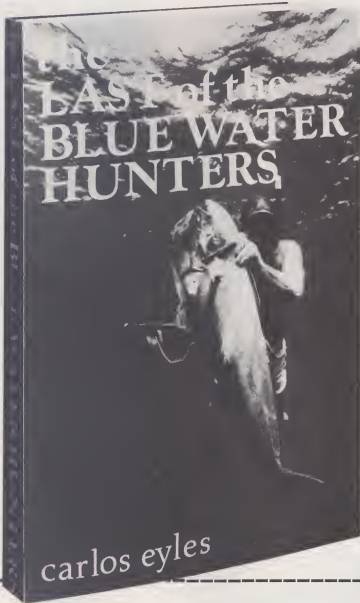
Conditions couldn't have been better that night. The cove was calm, and a big, bright moon lit the entire scene like a stadium. We rattled awkwardly down the path and clattered across the rocky shore like pack mules. I was resplendent wearing the entire contents of my car trunk. Surely nothing could have been more amusing than 275 pounds of swearing steel and neoprene struggling to attach an uncooperative fin keeper.

Within seconds after entering the water we were transformed into swift, agile creatures (not unlike sea lions returning to their



Nick Fain is a New York based artist and photographer. He is also a diving instructor and dives extensively along the East Coast.

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New England lobsters are not free for the taking. Check state laws carefully.

preferred element). We swam across the cove, planning to descend and follow the rock wall down and around the opposite point.

The moonlight offered some dramatic backlighting as we descended. Only our exposed lips suggested we were actually submerged in a giant tumbler of salty seawater.

Our descent was effortless; the simple route being the fuzzy contour of the rocky wall which after 30 feet, became richly carpeted by brilliant frilled anemones. These beauties were what brought me here.

We also encountered prancing lobsters which somehow knew we were from out-of-state. The anemones grew thicker and glowed in my light beam. They paused just long enough in the surge for some head shots. By the grace of Murphy, my camera strobe decided to go to sleep after half a roll. I now enjoyed the total freedom a diver can only savor when unencumbered by film or a lobster permit.

We saw everything from skate and squid to tiny juvenile shrimp and lobsters. Things became very tranquil at about 60 feet. Hanging suspended near that bright red wall was a beautiful silent adventure. I began to reflect on this special place. It rivaled space travel. But this "trip" could be made for the price of air and a short swim.

Soon our pressure gauges told us it was "Miller Time." We swam back the way

we came. A local police officer joined us back at the parking lot. He politely inquired if we had any two-clawed contraband. Authorities in New England are always friendly and helpful but they do mean business in the lobster and shellfish department.

We returned to Wetherill the next day and again two weeks later. On subsequent dives we circled a tiny island, which, while close to shore dropped down to almost 90 feet. Other sites offered wall and drift dives, artifacts, fish and a wide range of terrain. Most locations were within minutes of each other. Local dive shops provided information on tides, conditions, access and important local orientations.

If you crave a rocky coastline, you can start at Rhode Island and work your way north from famous sites like Ft. Wetherill to Nubble Light in Maine. A number of books will spotlight the marine life seen any day from the Gulf of Maine to the Jersey shore. The south shores of Long Island and New Jersey have mostly barren, sandy bottoms, but you can easily find adventure around the rocks of the Long Island Sound. Although you won't see sharks in Shark River, New Jersey, tropical fish from the Gulf Stream are abundant in late fall.

Whenever high seas keep you from boat diving, try diving your way along the New England coast. Your wetsuit or drysuit will love you for it. **\$**

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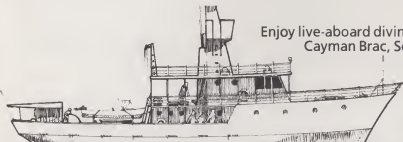
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COME ABOARD

Keeping Your Camera Alive and Dry

By Eric Hanauer

You've finally reached the diving spot of your dreams—200-foot visibility, the reefs virtually untouched, huge fish, fabulous wall, and a shipwreck thrown in for good measure. The folks back home will die when they see your prize-winning slides. After all, you took a photo course with a well-known pro, read all the current books and magazine articles, and are armed with the best camera equipment money can buy. Nothing can possibly go wrong. Wanna bet?

As any pro can tell you, the most important law in underwater photography is Murphy's. When you are thousands of miles from spare parts or a friendly repair facility, you've got to expect the unexpected and be prepared for it.

The degree of preparation necessary depends upon the degree of your commitment to underwater photography. A working pro will carry far more backups and spare parts than the casual snapshooter, but everyone can learn from his or her techniques. The most important considerations are packing cameras, what to include in a spare parts kit, and how to keep things working under less than ideal conditions. Most photographers have had to learn these things the hard way, whether they are electronic wizards or a mechanical klutz like me. Some of these lessons can benefit any traveling underwater photographer.

Preparation

Preparation begins at home long before your trip. Make sure all your camera equipment is in good working condition. If it's been out in salt water every weekend, it's probably working better than if it has been lying in the closet since your last trip to the tropics a year ago. The same goes for the photographer. Photographic skills deteriorate if they're not used. Just like a baseball player needs spring training to sharpen his batting eye, a photographer needs practice to make certain things automatic, like distance judgment and strobe placement. Make it a point to go out on local shooting sessions to sharpen your techniques. This is also a good time to try out new tech-

niques or equipment, so you can see the results and make necessary adjustments. That first far away trip isn't the time to try out a new 15mm lens. Learn how to use it at home. Making the mistakes there will help you avoid them later.

Unused camera gear gets as rusty as unused diving skills. O-rings dry out, shutter springs develop a set, strobe batteries discharge. Cameras need exercise too. One repairman recommends running them through all shutter speeds at least once a month. Better yet, take them diving.



There are two basic philosophies on preventive maintenance. One maintains, "If it's working, don't mess with it." Sooner or later the price must be paid for that approach. It could come at 150 feet on Ras Muhammed Wall, or while hanging on a line five feet under the surface. The end result is the same: a drowned camera.

Sand and salt crystals have a way of working their way down a shaft and scoring O-rings. A Nikonos has inaccessible O-rings underneath the film advance, the rewind knob and the shutter. After a while, they get brittle and take a set. Once a year they should be inspected and replaced if necessary, and the camera pressure tested. The price of this service at a certified repair facility is quite reasonable, especially when compared with the cost of fixing a flooded camera.



The wreck of the Aida at Big Brother Island in the Red Sea. Masked butterfly fish, opposite, stay just ahead of photographer. Opposite above are a lionfish and blue spotted stingray.

On housings, you will usually have to do the work yourself. Check the large O-rings and sealing surfaces for irregularities. Remove the shafts and replace the O-rings inside the glands once a year. Be careful that you don't scratch the groove while removing the O-ring. If the anodized coating inside the aluminum gland is damaged, corrosion can form underneath and cause a leak. After replacing the O-rings, take the housing underwater without the camera inside to check for leaks. That should be standard practice any time major work has been performed on a housing. Whether you use a housed camera or a Nikonos, shoot some film with it after the work has been done, and before you leave on your trip. If there are any glitches, now is the time to find out.

Batteries are something we always take for granted until they fail. The tiny cells which power light meters, for example, have an effective life of about a year. On my birthday, I always give my meters a present of new batteries. Don't forget to bring along spares for strobes, lights and cameras.

Packing

Once the equipment is in top shape, it's time to decide which of it to take along on the trip. Take all of it. And then take some more. Underwater photographers can't travel light. Before leaving on my second trip to the Red Sea, I visited Jack McKenney to get some tips on preparing

A thousand miles from home is no place to discover Murphy's law.





These clownfish are safe from predators within the anemone's tentacles.

for photo assignments in remote areas. Proudly I told him about all the backup equipment I had collected and borrowed including an extra Nikon body, two extra Nikonoses, a camera shop full of lenses, and three underwater strobes. "Hmm," he said, stroking his beard. "You're a little light on strobes." Thoroughly chastened, I quickly borrowed two more.

The name of the game is redundancy. That is easier said than done, because few of us have an understanding friend with a spare 15mm lens, or the wherewithal to purchase a second one. But a 20 in a housing can do the work of a 15 in a pinch, albeit with a bit more difficulty. So can a slip-on lens, with a bit less sharpness. But if the unthinkable happens to the 15, using a pinch hitter is better than taking no wide-angle pictures at all. Having a backup can provide a tremendous sense of security.

The next question is how to pack it all. The airlines have never been very understanding of divers and underwater photographers. Now that business is very competitive, agents are even less likely to let a piece of excess baggage slip through without additional tariff. Current regulations allow two checked bags on international flights. The answer is to pack as much camera gear as possible in one large box. Something like a Coleman 80-quart ice chest. It's much cheaper than

the custom cases designed for underwater camera gear. It doesn't alert thieves by advertising, "Expensive camera gear inside." Nothing on it corrodes, so it will survive in a saltwater environment. You can sit on it, stand on it, and generally abuse it with no ill effects. Its insulated walls help protect the film inside from high temperatures.

All it lacks is a good lock, and you can take care of that. Install a metal hasp in place of (or next to) the plastic snap tab. Drill the screw holes all the way through the lid and use nuts and washers to tighten them. Be sure to install the hasp so that the screw heads are covered when it is closed. Then secure it with a brass padlock. Nothing can stop a really determined thief, but this arrangement will slow him down a while, and perhaps encourage him to seek easier prey.

Don't waste valuable space by purchasing photo foam to protect the cameras. Clothes make excellent packing material. This way, the cooler doubles as a suitcase on the airplane. A soft bag, also packed inside the Coleman, can serve as a suitcase once the diving destination is reached.

Most photographers agree that airport X-ray machines can harm film, and that the effect is cumulative. In many foreign airports, harried and undermanned security agents refuse to visually inspect carry-on baggage. In others, checked baggage

is routinely subjected to X-ray inspection. The only way to keep your film from being ruined is to pack it in lead-lined bags. In addition to affording protection from radiation, the bags help in cataloging film, separating types or exposed from unexposed film.

A changing bag is another valuable accessory. If your camera jams with those once in a lifetime shots inside, it can be a lifesaver. With the camera inside it, you can remove the film unharmed. In an

Most photographers agree that airport X-ray machines can harm film.

emergency, a wetsuit can substitute for a changing bag. However, it is likely to be wet and salty, which is dangerous to the camera's health. Furthermore, your hands will be sweaty enough from the heat and the tension without the extra insulation of a wetsuit.

On the boat, towels packed judiciously around the cameras will protect them. In the Red Sea, the Egyptian boat crew

at first made good natured fun of my heavy, unwieldy case, calling it "King Tut's Tomb." But after a couple of weeks they were pointing out its advantages to send divers on board the boat. Within King Tut's Tomb, all my underwater camera gear, including film, strobe arms and tools, was located in one place. And when not being used, the cooler provided seating for two people.

A small tackle box can be packed inside a dive bag to carry small items like medicines, spare parts and tools. Don't get carried away and try to bring along an entire dive shop to prepare for every remote contingency. Confine it to the basics which probably won't be available at the dive site. It's amazing how much can be contained in one small tackle box. Here is the packing list for the one I carry on long dive trips.

Camera Gear

- ☐ E-O connectors
- ☐ Remote slave sensor
- ☐ Spare O-rings

- ☐ Band Aids
- ☐ Sudafed
- ☐ Marezine
- ☐ Aspirin
- ☐ Lomotil
- ☐ Neosporin ointment
- ☐ Antibiotic capsules
- ☐ Adolph's Meat Tenderizer

Dive Gear

- ☐ First stage adapter
- ☐ Assorted O-rings
- ☐ Dive tables
- ☐ Tie wraps
- ☐ Spare regulator mouthpiece

That sounds like a lot, but tackle boxes have a way of swallowing a lot of gear keeping it organized. Small items are kept in plastic bags or in the ubiquitous film canisters. Be sure to mark them clearly, because one pill can look just like another.

Camera Care

Careful preparation, routine and time are the keys to keeping underwater photo equipment working well. Pressure, haste

tire roll on "R." After removing the film, place it in a canister identified with a number (using waterproof Magic Marker). Log the location of the dive, and any pertinent details you want to remember about the pictures, indexing it to the roll number. Put it in the lead-lined bag for exposed film.

Now remove the O-rings from the lens and camera body. Clean them by running them between your fingers, feeling for sand and grit. Clean the O-ring grooves with a Q-tip. Then lubricate the rings lightly with silicone grease. Do the same with the opposite sealing surfaces. Don't overdo it. The O-ring should look shiny but not greasy. It's better to use too little grease than too much, as any excess tends to collect crud. A two-ounce tube should be sufficient for about 300 photo dives, making it one of the best bargains around.

Inspect the contacts on the male strobe connector. If using an "EO" connector, be sure the copper contacts are shiny. Copper oxide doesn't conduct electricity well, and is one of the major causes of underwater strobe failures. Use a very mild abrasive to clean the contacts. Toothpaste is very effective, moistening the fingertips with it and twisting the contacts back and forth. If they are really cruddy or have failed to fire during a dive, use Comet cleanser. I keep a little in a film canister. Moisten your fingertips, pick up a little of the powder, and twist the contacts between them until they shine. Use this technique sparingly because cleanser will slowly wear away the copper. Never use sandpaper on contacts, even the finest grade.

Finally, place the tube of silicone grease against the open end of the female connector and insert a dab of grease. When inserting the male connector at the start of the next day's diving, it will push out a small ribbon of grease. Pack that around the connection to help insure good electrical contact.

For a housing, daily maintenance is about the same. Put a dab of grease on each shaft, then run it up and down to lube the O-ring. Check the main O-ring and the surface it seals against.

Sometimes, despite all your precautions, a housing will leak. Fortunately, they tend to spring annoying leaks rather than disastrous floods. A moisture sensor is cheap insurance, and will provide an early warning. This usually consists of a probe in the bottom of the housing, which triggers a small LED in the viewing port when a drop of water contacts it. Some also have a sonic alarm. If the alarm goes off, hold the housing upright to keep the water in the bottom, and beat a hasty but dignified retreat to the surface. Avoid tilting the housing, which will slosh water on the camera.

Now is the time for some detective work. Remove the camera from the housing. (Please turn to page 75)



"King Tut's Tomb" awaits loading onto a dive boat.

- ☐ Spare glands for housing
- ☐ Q-tips
- ☐ Jeweler's screwdrivers
- ☐ Comet cleanser (for cleaning electrical contacts)
- ☐ Pipe cleaners
- ☐ Allen wrenches
- ☐ Needle-nose pliers
- ☐ Electricians' tape
- ☐ Pledge Furniture Polish (for plastic parts)
- ☐ Small can of WD-40

General Tools

- ☐ Swiss Army knife
- ☐ Crescent wrench
- ☐ Pliers
- ☐ Screwdriver
- ☐ Zip lock bags

First Aid

and last-minute fixes are a camera's worst enemies.

First, find a place to do the work. You will need an area free from sand and salt water, where you can spread out equipment, and people won't be looking over your shoulder all the time. It could be in your hotel room or on the boat. A small boat can get awfully crowded, so you may have to do the work in the evening, while others are discussing the day's dives over a beer. This is the time for major preventive maintenance.

Set out a clean towel, Q-tips, silicone grease and fresh film. A Nikonos should be rewound as soon as possible after the dive, and the shutter reset to strobe sync speed immediately after rewinding. That will prevent opening the camera back on your masterpiece slide, or shooting an en-

Diving the Philippines is like biting into the forbidden fruit.

By Robert McQuilkin

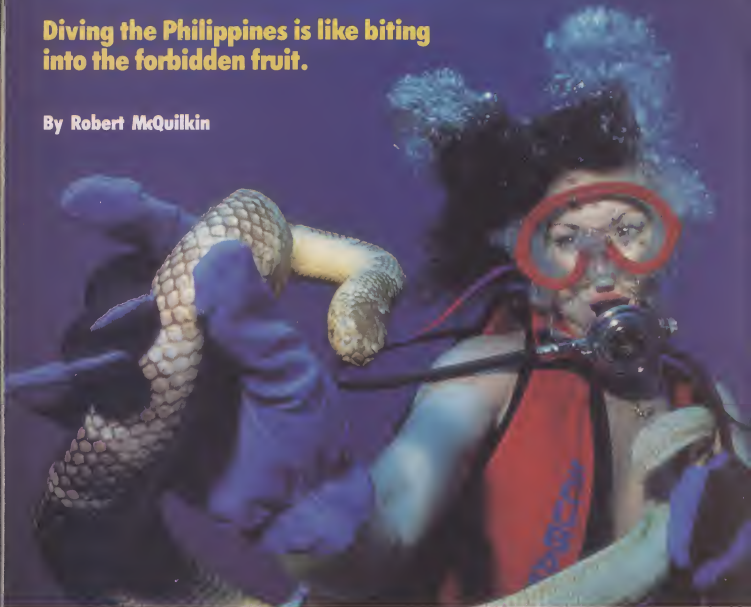


Photo by Patti Jones White



There's a peculiar fruit in the Philippines called a durian. Most visitors avoid it. Easily recognized, durian smells like the musty gas escaping from the hanging caskets in northern Luzan. Dirty brown, wrinkled, and balding, with scattered strands of hair, it could easily be the shrunken head of an old man. Its taste, if you are able to eat it in spite of the resistance of your senses, resembles a kiwi/strawberry/pineapple amalgam that is irresistible—a bench mark to which no other fruit can measure up. In fact, other fruits seem bland by comparison.

Diving in the Philippines is a lot like biting the forbidden fruit. Its unfair advan-

tage over the rest of the undersea world alters your expectations forever.

Ask Ludy Furong. A 35-foot whale shark paused to observe her first open-water check-out dive off the coast of Batangas. Assuming this was routine saltwater stuff, she paid it no attention and got on with the business of mask flooding.

Lynn Funkhouser, on the other hand, has been diving the Philippines for 12 years and knows what to expect, which is one of the reasons she keeps going back. Beneath Tubataha, one of her favorite dive sites, giant sea turtles, white-tip sharks, and manta rays are so common on every dive you take them for granted. But this year a large manta ray circled twice, winged in on her, and they began to spiral upward in a ballet. For five full minutes they danced and circled, eye to eye before Lynn reached out to touch him.

Robert McQuilkin is an award winning photo/journalist whose credits include *The New York Times*, *Outside*, *Popular Photography*, *Ski* and *Backpacker*. He is the author of six books and currently teaches photography at the University of Chicago.

fast. Their metallic armor reflecting sunlight just below the surface somehow turned them to jet fighters flying a 1,000-plane formation through their wet sky.

Halfway down the belly of one atoll you can enter a series of connecting caves—shark bedrooms. Their residents are not always sleeping but when they are, you can generally lie with them undisturbed and undisturbing.

Offshore more than 500 so-far-identified species of reef-building coral crowd the water. Black coral grows wild at 10 feet and rare shells like the gloria maris or *Cypraea guttata* are strewn haphazardly about. Victor Dan bought an estate after selling the first live-collected *Cypraea guttata*. You find yourself dropping a \$500 shell to pick up one that might be valued at \$1,000 or \$2,000. Conservatively, I would say 90 percent of the region has



Too Great a Temptation

Instantly he recoiled. Disappointed for having broken the spell with a simple gesture of affection, Lynn curled up in a submissive position and the ray came back, his eyes locked in contact as the waltz resumed, inches apart. When it finally ended she felt a sweet guilt, like Psyche having her secret affair with Cupid; indulging in the forbidden.

You don't need a guide book to dive the Philippines, you can hardly miss. Still, there are selective areas with different attractions. Tubataha is a group of islets in the middle of the Sulu Sea that you won't find on the map. But once there, you don't have to look hard to spot sharks, porpoises, manta rays, whale sharks, pilot whales—just stick your head underwater, they're always in season. This past May, Lynn jumped ship and landed in a pack of 3- to 5-foot cudas heading somewhere

In the rough vicinity of Tubataha, Beverly and Don Rock, who's a retired Navy physician, were sailing their *Tayana 37* when they thought they saw a logjam in the middle of the sea. It turned out to be a flotilla of hundreds of basking dolphins. As their bow entered the mass of motionless bodies, it parted and then closed behind the ship unaffected but for an occasional spout. I lamented how it could have made a spectacular underwater picture. The behavior remains unexplained.

Just to the west of Tubataha lie the Palawan archipelago of more than 2,000 mostly uninhabited islands. Seven dive operations serve the area. These remote islands—the Galapagos of the Philippines—abound with such rare wildlife as mouse deer, white parrots, purple herons, scaly anteaters, and monkey-eating eagles that control the topside of the islands.



Photo by Lynn Funkhouser

Travel Tips

You don't need a packaged charter tour to dive the Philippines, just show up in shorts with a couple traveler's checks—and not too many of them. Diving is so common and abundant, not to mention inexpensive, you can head for the nearest service or charter your own dive boat for the price of a cold beer back home. Of course packages are available and can save a little time and organizational effort, but I've always held that adventure rides shotgun when you're out on your own.

There are three main diving areas: Batangas, Visayas, and Palawan, with more than 40 certified services as well as resorts and hotels that rent dive gear. The best sites in Palawan include Honda Bay, Taytay Bay and Tubbataha off the coast. Visayas claims to be the diving capital of the Philippines and has numerous excellent sites but those with something extra include, Cervera Shoal, Cabilao Island, Balicasag Island, Sumilon Island, Moalboal and Mactan Island where whale sharks congregate every winter. In the Batangas region you'll find Anilao superior in wildlife to any other site in or out of the Philippines.

The best time of year to dive is December to May and the best service centers in each area are respectively: El Nido Resort, Miniloc Island, Buena Suerte, El Nido, Palawan, Philippines; Bohol Beach Club, Panglao Island, Bohol, Philippines; and Dive 7000 Resort (in Batangas), PO Box 7545, ADC-MIA Pasay, Metro Manila, Philippines.

Another dive option is to sign on with one of several live-on dive boats with compressors and 220-volt power with converters, that generally access the more remote offshore dive areas. Booking addresses include: Gloria Maris Adventures Inc., 2nd Floor Atlantica Bldg., Herrere Cor. Salcedo St.,



Legaspi Village, Makati, Metro Manila, Philippines; Live Aboard Diving Inc., 3rd Floor Philippine Standard Bldg., 151 Paseo de Roxas, Makati, Metro Manila, Philippines.

Should you get wet feet after they touch down but before they touch water, on-the-spot dive trips can be organized by Gretchen Hutchinson, Dive Versions, 1383 Campanilla, Das Marinas Village, Makati, Metro Manila, Philippines or see US contact below. In Manila try the recently established (1984) Diving Industry Association of the Philippines, Luchi Dela Cruz, 2172 Pasong Tamo St., Makati, Metro Manila, Philippines.

Those who want preplanning from door-to-dive can have just that through Dive 7000 which offers dive tour packages for two weeks including room and board, tanks, boats, guides and air fare from the west coast for a hard to believe or beat \$1,600. Contact Dive Versions, 1310 N Ritchie Ct. 3-D, Chicago, IL 60610. Poseidon Ventures also offers tours with Lynn Funkhouser

for two weeks aboard a 120-foot diving yacht with a crew of 18 for \$2,600 from the West Coast. Poseidon can be found at 359 San Miguel Dr., Newport Beach, CA 92660, 800-854-9334.

The advantage of going it alone is that it's so easy to pull off. English is the national language, everyone is friendly and helpful, travel, food and accommodations at the current exchange rate are embarrassing—you never have enough change. For instance the five-hour cruise from Cebu to Bohol in first class costs \$1.50. The variety of fish is rivaled only by that of fresh fruit where bananas go for half a cent, mangos for a dime and fresh pineapples for a quarter.

The Philippines is served by three airlines: Northwest Orient, United and Philippine Airlines. The advantage of PAL is their direct non-stop flights to Manila and full beds (in first class) that can make the night passage disappear. Further, passengers arriving on international PAL flights receive a 50 percent discount on all domestic flights between islands. If that's not enough PAL also offers flying scuba diving cards that allow 30 extra kilos of dive gear on board at no charge. Ask for an application at Tours & Promotions-Philippines, Philippine Airlines Inc., Administrative Offices Building, Domestic Terminal Rd., Pasay City, Philippines.

More information can be obtained from the Philippines Ministry of Tourism at:

Suite 111, 30 N Michigan, Chicago, IL 60602, 312/782-1701

Suite 1212, 3460 W. 10th Ave., Los Angeles, CA 90010, 312/487-4525

Philippine Center, 556 Fifth Ave., New York, NY 10036, 212/575-7915

Agri-fina Circle, Rizal Park, Manila, Philippines 599031

Ask for the Sports Scuba Diving booklet, read it, dream about it, plan it, but if you decide to go, be forewarned. It may alter your tastes forever.

never been dived. On Balabac Island, merely miles from the coast of Borneo, divers are scarcer than whales.

The dilemma most often seems to be finding time to eat or sleep, not that that's a problem in the Philippines where beach huts run a dollar a day, \$15 for five-star hotels, and five-course meals for \$2. In fact, you can hire a dive caddy of sorts who will assemble your dive gear and haul it around 24 hours a day, run errands, and make all your arrangements for about \$7 a week, tip inclusive. The problem is there are temptations to in-

duge everywhere.

The solution is simple—yield to them. On the Palawans, where decompression always wins out over leisure scheduling, there's no break on the surface either. Down to the southwest of Malapacup Island runs a cathedral shaped underground river through the heart of a granite mountain emptying into the South China Sea. Bancas, or outrigger canoes, can be hired to make the trip, and either dive lights or steel nerves are recommended options. Farther north some 200 caves dimple the face of a cliff containing arche-

ological relics such as the recently discovered 20,000-year-old Tabon Man. Most of the caves have not been entered. Again, bring your dive light or feel for the bones and the bats.

One hundred miles offshore, a group of islands called Tubbataha stand, their heads barely above water. If a discerning diver designed the perfect coral reef, laying it out with ledges every 10 feet or so from 300 feet right up to the surface so you could continue to explore while decompressing, landscaped it with giant fans, exotic shells, three cleaning stations

(Please turn to page 78)

"CAN'T WE BUILD A (☆!©#!) PARKA THAT DOESN'T IGNORE THE OBVIOUS," STORMED MOTHER."

—Tim Boyle



I'll be candid. Even though she's President of Columbia, my mother's not what you'd call an avid outdoorsman. Still, she recently observed something so painfully obvious that it should push parka technology ahead twenty years. It did for us.

Her revelation: Weather Changes.

While this may not sound overly profound to you, it is curious to us that apparently no jacket manufacturer has yet to notice this phenomenon. Including ourselves.

But we have just rectified the situation. Examine our Palmer System IV Parka™. It is literally four jackets in one. The outer shell is of Gore-Tex® and Exacta™ Cloth. The zip-in reversible interior is buffalo plaid Polar

fleece on one side, Exacta™ Cloth on the other. The tall tunnel collar looks as good as it works.

Now, ponder the possibilities.

You're skiing early and it's colder than sin at the top of the lift. So you zip *both* shell and liner together for extraordinary warmth. Later, the sun comes out and you heat up. So you stow the liner and just go with the shell. For a little après activity you wear the rather dapper-looking buffalo plaid liner alone. Or reverse it for snugness.

Point being, here at long last is a parka as changeable as the weather.

Now, while other manufacturers may have failed to notice that the weather changes, we suspect they will be quick to notice that our parka does. So in a year or so you will probably be able to pick up a reasonably good copy of our Palmer™.

Or, you could go out and pick up an original now.

Something my mother would much more prefer.



Columbia
Sportswear Company

The Palmer System IV Parka™ is available at finer outfitters everywhere. For a color brochure send \$1 to us at 6600 N. Baltimore, Dept. AF, Portland, Oregon 97203.



Gore-Tex® is a trademark of
W. L. Gore & Assoc., Inc.



Sometimes the weather
turns extremely cold.



Sometimes it turns
cold and wet.



Sometimes it turns
cold and crisp.



Sometimes it turns
mild and wet or windy.



Cozumel...

By Cathie Cush



THE CURRENT SITUATION



Divers might find themselves being carried away by the excellent diving at this Mexican resort.



Two by two, the Cyalume "stars" in the constellation ahead of us winked out as the other divers in our group disappeared into the darkness beyond the far side of Cozumel's Paradise Reef. Enthrilled by the antics of a free-swimming spotted moray, none of us noticed, or if we did, we didn't give it a second thought. The eel was busy trying to nibble the end of a flashlight and we, sheltered from the current by a few large coral heads, were enjoying the evening show.

When the moray finally disappeared into a crevice, we continued on our way, one eye on the reef and one eye on our consoles. It was the third dive of the day, and the divemaster had ordered a conservative profile—40 feet for 40 minutes. We weren't surfacing a minute early. There was so much to see.

Finally we nodded to each other and headed up. When we reached the surface, a boat was waiting only a few yards away, and the mate helped us up the ladder. We were the first ones on board, which didn't strike me as strange until I went to put my fins in my gear bag and couldn't find it.

It was starting to dawn on my buddies, too.

"Uh, this isn't..." Rosanne began, looking around for confirmation.

I spotted a small white light bobbing on the horizon. "Vikingo?" I asked the mate. He smiled and got on the radio.

"We're on the wrong boat," Denny said. We started to laugh.

A few minutes later the two nearly identical wooden boats had pulled alongside each other, and we climbed on board the *Vikingo*, where the rest of our group had already dried off and stowed their gear. Maybe there was something more to this drift diving after all.

Cozumel lies about 12 miles off the coast of Mexico's Yucatan Peninsula, a rocky limestone island in the azure Caribbean. About 200 square miles, Cozumel was originally inhabited by the Maya Indians, whose descendants still populate the isle. The channel between the island and the mainland is 3,000 feet deep at some spots. The reef along Cozumel's coast is part of the second largest system in the world. Scuba divers and sport fishermen discovered the island's appeal in the 1960s, and today it's also a popular port of call for Caribbean cruise ships.

The warm waters of the Gulf Stream pass either side of Cozumel.

If you dive in Cozumel, you'll experience a current. You'll have no choice. Drift diving in Cozumel isn't like wall diving in Cayman. People visit Cayman to dive The

Wall, and after making a wall dive, they hit a shallow reef or a sheltered sound. In Cozumel, you've got to contend with some degree of current every time you get your fins wet. Some days, at some sites, it's stronger than others, but it's always there.

"Current. No big deal," I told myself as I slipped my shorts on before the week's first dive. "I cut my teeth on Jersey." In my misguided little mind, I had associated strong current with cold, dark water. The crystal blue Caribbean awaited. How bad could it be?

It wasn't bad at all—in fact, it was great! But it was strong.

One by one the divers in our group took giant strides off the platform across the transom and grabbed the line that was floating behind the boat. It took some determination to hang on. As we jockeyed for position on the crowded rope, the jostling at first was a little perturbing.

As soon as we got the signal, we let go of the rope and the current nudged us apart. When I hit about 20 feet, I looked over at our divemaster, a 19-year-old native named Tomas. He was casually putting his gear on as he made his descent. The ultimate bail-out demonstration.

As per our instructions, we leveled out a bit shy of 80 feet. The spot, Palancar Gardens, was about an hour's boat ride south of our hotel, La Ceiba. The reefs

Cathie Cush is a free-lance writer based in Pennsylvania. She has contributed to many diving publications.



Take a healthy, well-protected reef system with both shallow and deep sites, and add spectacular visibility and an abundance of marine life. For atmosphere throw in a current that's just strong enough to keep the sea fans rippling in the water like trees in a gentle breeze and the diving challenging and you've got Cozumel.

To that add a consistently comfortable climate, easy access, a wide variety of accommodations and bargain prices, and you've got a great dive destination.

Travel: Continental and American airlines fly direct to Cozumel from points in Texas. From the East Coast,

Cozumel Compass

travelers can fly via AeroMexico or Mexicana Airlines to Cancun, and take the AeroCozumel "air bridge" to Cozumel. This 15-minute commuter flight leaves Cancun airport every other hour.

Weather: The temperature varies from the mid 70s in winter to the high 70s or low 80s in summer. Rainfall is greatest in September and October, averaging 10 inches per month.

Accommodations: Cozumel offers dozens of places to stay, ranging from economy inns and small motels to luxury hotels with all the amenities. For those who don't require a beachfront room, modest motels in downtown San Miguel are bargains at just a few dollars a night. The larger beachfront hotels such as La Ceiba, Sol Caribe and El Presidente charge in the vicinity of \$50 per person per night, depending on the season and the package.

Diving: Cozumel dive operators offer a variety of diving opportunities ranging from resort courses to week-long dive packages. Advanced certification is available, and all major certifying agencies are represented. A two-tank

dive (including tanks, weights, soft drinks and lunch) averaged \$35—somewhat less as part of a package. Our package from Discover Cozumel included as many night dives as we wanted for free.

We talked to a lot of divers over the course of the week. Most were diving with the larger of the island's two dozen or so operations—Discover Cozumel, Dive Paradise, Caribbean Divers, Dive Cozumel, Aqua Safaris and Fantasia Divers—and none had anything but praise. In fact, several first-timers noted that they were "pleasantly surprised" at the caliber of the operations.

Most dive boats pick up divers at the dock in front of La Ceiba, so dive packages and hotel packages can usually be mixed and matched. Some hotels, such as the Galapagos Inn and Divers Inn, have their own dive operations.

Food: Most dive operations include lunch at San Francisco Beach as part of a full day dive trip. The dive boats leave the dock at 9:30 or so each morning, so we ate breakfast at the hotel (\$1.50-\$3). In town there are restaurants of every sort, from local

that run along Cozumel's western shore are part of one of the world's largest reef systems, second only to Australia's Great Barrier. The reef called Palancar has several distinct sites, three of which we hit during the week. The reefs fall under the protection of Mexico's national park system—no spearfishing, no lobstering, no shelling, no coral. The only souvenirs we take are photographs.

Ease on Down

The current was light the first day, or maybe the huge coral columns afforded us more shelter here than at some other spots. And it doesn't seem to be as strong at depth as it is on the surface. The wall sloped gradually down to a bottom some 3,000 feet below, but there was plenty to see between 50 and 80 feet. There was coral below us and more coral above us, and the visibility was at least 100 feet. Dancing rays of sunlight filtering down through the coral heads made the reef look like a giant cathedral; black grouper slipped like monks through the silent corridors.

Neutrally buoyant, we barely had to kick to move along the reef. We followed the grouper through the tunnels between the coral heads—or they followed us. They seemed to have territories staked out, and they approached us expectantly, looking for handouts. Only when we

stopped to feed the fish, did we notice the current. Moving took no effort, but we had to work to stay still. That's a switch!

Poised in midwater over a sandy spot surrounded by coral heads, Rosanne removed the plastic bag she had stashed in her BC, and the toast we saved from breakfast floated from it. In a few seconds she was surrounded by snappers. On the

Neutrally buoyant, we barely had to kick to move along the reef.

fringe, two curious grouper paced back and forth, looking to see if they were missing anything worthwhile. Beyond them, a circle of divers watched the show.

Rosanne emerged from the cloud of silvery scales and handed me the bag. She'd had enough, but the fish hadn't. The yellowtail made short work of the rest of the crumbs, and the grouper looked bored. For future dives, we saved not only the remnants of breakfast, but uneaten

seafood combinations from dinner. Desperate for fish one day, we bought a few small bags of a Mexican corn snack seasoned with lime and chili powder. The fish didn't like them any better than we did.

Before we knew it, Tomas was twirling his index finger, reminding us to do our 360s and look upward as we ascend. For a group of mid-Atlantic divers accustomed to having to keep track of the boat, not having to worry about getting back to the anchor line was a welcome change. There wasn't one. After dropping us into the water, the captain had hauled up the anchor and followed our bubbles. When we surfaced at a moderate distance from the boat, he motioned to us to stay put and brought the boat around.

We had spent nearly 40 minutes at 80 feet. After the morning's wall dive, the boat drops us at San Francisco Beach, a public beach where we are fed lunch and allowed to spend our interval time in the sun. After about two and a half hours, we hit a shallow patch reef called Yocab, then headed back to the hotel.

Dont-Fight—Switch

The next day, at Columbia Reef, we got a better idea of the true meaning of drift dive. "It was kind of like being on a Disney ride," one of our party commented afterward. The current seemed to be moving at least as fast as I can run on dry land.

food to American steak joints to pizza and Chinese—and many are open-air cafes. A full-course fresh seafood dinner with cocktails averaged \$10. We spent about twice that at Acuario, one of San Miguel's best restaurants.

Walters prepared dinner and flaming coffee at tableside, yet we were comfortable in shorts and T-shirts.

Entertainment: Carlos 'n' Charlie's bar and grill is worth a visit—good food, good drinks, rowdy crowd, rowdy waiters. If you ask the waiters where to go dancing, they'll give you a pass to get into Scaramouche, a popular disco. There's another large disco, Neptuno, at the end of town, but for the most part, Cozumel is quiet after midnight.

Getting around: Car, Jeep and mini-bike rentals are available for day-long island exploration, but taxis cost only about \$1.50 per carload from town to the dock where the dive boats leave, so why go through the hassle?

Further information: Contact the Tourist Information Center, Cozumel, Quintana Roo, Mexico; telephones 2-09-72; or call your travel agent or contact dive shops listed in this magazine. **S**

(I'll never make any Olympians nervous but that's pretty quick for water.) Fooled by the previous day's calm, I had decided that photography would be no problem. Within 15 seconds of grabbing the line behind the boat, I wished I had left

my camera on the boat.

I was able to get myself organized as we descended. To avoid damaging the coral, the captain had put the anchor down on the sandy bottom. We had to swim about 50 yards across sand to reach the reef. Instead of trying to fight our way across the current, we let it take us with it just as we would do once we got where we wanted to go. By swimming at a very oblique angle, using our fins more to steer than to struggle, we'd eventually hit the reef—with a lot more air left to enjoy it than we would have otherwise.

Handling Cozumel's currents is essentially very simple. The ticket seems to be to relax and go with it. (That frame of mind—a very Mexican if not Caribbean, attitude—makes it easier to cope with the islands topside, too.) Once the reality that you don't have to get back to the boat hits home, I think you breathe a little easier. Then you can go about fine-tuning your drift diving skills.

In a current, simple acts like stopping to look at something take a little maneuvering. You can't just stop swimming, or you'll be long gone. A few times I wanted to turn around to examine something I'd caught a glimpse of, and it just seemed like too much effort. The fish swim against the current with an ease that's very deceptive, as I discovered one day while trying to follow a pufferfish. No pufferfish pictures this trip.

The easiest spots to stop in are the tunnels and crevices between pillars of coral. These are relatively free of current. You may still need to brace yourself with one hand against something sturdy—preferably not a piece of living coral. The current didn't seem to be as insistent along

the sides of the reef as it was on the top. On some of the shallower dives I was able to lay flat in the sand and watch arrow crabs, banded coral shrimp and all sorts of other macro creatures for almost as long as I wanted, provided that I didn't lose track of the rest of the group. On the reef's higher ridges, remaining stationery was out of the question.

Taking pictures was a challenge for the same reason. Guesstimating distances for a rangefinder camera like the Nikonos takes some getting used to underwater, especially when both you and the subject are moving.

Airplane Disaster

Over the course of a week we visited about a dozen different sites along the reef, each with a name as exotic as its "landscape." And at each site, we found something to make the dive special. The black grouper trying desperately to have its picture taken at Palancar Caves; the army of spiny lobster at Santa Rosa; the narrow tunnel filled with silversides at Punta Cedral. On one night dive we find three octopi at Paradise. Even the wreckage of a small plane, sunk in 30 feet of water in front of the hotel, has memories to offer when we make an "adios to the island dive" our last night there.

La Herradura, the Palancar Horseshoe, is everyone's favorite site. A crescent-

(Please turn to page 76)



DIVERS "Hi" SIGN

Signal other divers that you're one of them. Wear the bold red t-shirt with the white silk screen stripe, symbolic of the scuba divers flag. They come in S (34-36), M (38-40), L (42-44), and XL (46) at \$10, each, including U.S. postage and handling.



Send check or money order to:
Flagship Enterprises
P.O. Box 430
Huntington Station, N.Y. 11746
(allow 2-4 weeks for processing
and check clearance)

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+	+	+	+

\$10 = *Sub
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Foreign orders add \$1 per shirt.

N.Y. State residents add sales tax

TOTAL AMOUNT ENCLOSED

*deduct 10% for order of
2 dozen shirts or more

SHOPPERS' CORNER



SCUBAPRO D300 SECOND STAGE

The SCUBAPRO D300 Second Stage is a total escape from conventional regulator design. Its unique engineering rudiment was developed from the U.S. Navy acclaimed SCUBAPRO Pilot and A.I.R. I regulators.

Breathing characteristics of the D300 center on a unique Pneumatically Balanced Demand Valve. This valve design is virtually unaffected by incoming pressure fluctuations and provides a smooth, almost effortless, flow of air regardless of depth. The D300 and A.I.R. I pneumatically balanced poppet design utilizes counteracting air force to accomplish "pneumatic (air) balancing."

Molding the D300 from a rugged Fiberglass Reinforced Polyester promises more than just a futuristic appearance. First, the material is much lighter and jaw fatigue is a thing of the past. Second, the material itself will not corrode even when exposed to constant saltwater use. Many of the internal components are also made of similar polyester materials increasing long term environmental resistance of the entire regulator.

The D300 has an aspirator controlled assist, V.I.V.A. (Venturi Initiated Vacuum Assist) that helps maintain air flow after the initial inhalation. Taking full advantage of this "air motion principle," the internal shape of the case must be aerodynamically molded to allow smooth air transmission.



A selector switch on the D300 helps prevent accidental loss of air during the preparation, entry, and exit portions of the dive.

The lower half of the D300 is surrounded by a molded rubber cover that functions to deflect the exhausted air, protect the diaphragm/exhaust assembly, cushion the regulator from abuse, and provide self flexible purge surface for easy access with gloved hands or mittens. This cover blends the entire regulator into one, streamlined sculptured shape.

For further information on the SCUBAPRO D300 Second Stage, contact your nearest SCUBAPRO dealer.

NEW QUAD VISION MASK

Designed by SCUBAPRO, the Quad Vision Mask increases vision dramatically. Its wrap-around concept incorporates four individual "windows" providing up to 30 percent additional peripheral vision. Versatile, the Quad Vision can also be fitted with corrective lenses. With a new superior seal for added comfort, and a new multi-stop strap, the fit is incredible. Packaged in a protective container for safe gear bag storage. Available in blue or orange. SCUBAPRO has the vision of the future ... today!

HOODLESS SWEATSHIRT

Flash ... We have had several requests for sweatshirts without hoods ... To meet your requests we now have a very attractive hoodless sweatshirt. It is navy in color with a solid white contrasting stripe sewn into the chest and around the arms. Like all of our fashions, it is available in four sizes: small, medium, large and extra large.

These sweatshirts are just right for after dive wear, yet they have the look of sophistication when worn as casual attire.

SON-OF-THE-GUN TUBE SNORKELS

Customize your diving appearance! "Son-of-the-Gun" tubes are now available in translucent blue, translucent red, orange, and crystal. Choose a color and add it to the crystal silicone "Son-of-the-Gun" mouthpiece, and you have the smartest looking snorkel with patented Shotgun performance. Now, you can color coordinate to your mask, jacket, etc. With new high visibility decal, it is attractive and functional.



TITANIUM KNIVES

The SCUBAPRO Titanium knives feature an amazingly fine cutting edge and a serrated opposing edge. In addition a special notch for line cutting is positioned near the hilt. Injection molded sheath includes a spring loaded locking device. SCUBAPRO Titanium knives are available in two sizes. Another breakthrough from SCUBAPRO. High tech Titanium blades make these the most exotic and practical knives in diving. Titanium is the perfect blade material — stronger and lighter than any other metal. Corrosion-free and anti-magnetic, they are the ultimate in knives.

INTRODUCING THE SEA-WING FIN

This remarkable new fin combines the hydrodynamic features of a fish's fin with the most modern principles of aircraft technology. The blades of the SCUBAPRO Sea Wing are not designed to simply push water backwards, but to provide lift that translates into forward motion for the diver throughout the entire power stroke. Most fins create movement through opposing pressure waves. The Sea Wing uses hydrodynamic lift to pro-



duce forward motion.

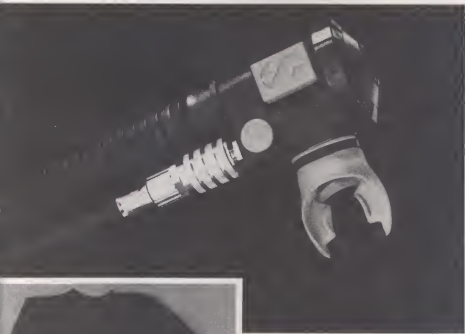
The foiled edges of the Sea Wing are open to undisturbed water flow creating less drag. Other fins have ribbed side rails which start at the foot pocket and extend to the sides of the blade. The Sea Wing is the first fin which allows the lateral portion of the fin blade complete access to "clean" water.

By knotching the longitudinal straight ribs, a flexure area is created in the center of the fin. The flex area creates a controlled bend, maximizing thrust direction, increasing the overall thrust of the fin. Additionally, strain has been reduced on the foot tendon and ankle joints. This flex area also maintains the proper angle or attack.

Stabilizing vanes are another integral function incorporated into the Sea Wing Fin. Located on both sides at the top of the blade, these vanes improve the diver's track, straight through the water.

The foot pocket of the Sea Wing is a black thermoplastic rubber compound that has been specially designed to hold the SCUBAPRO Delta Dive Boot with more comfort and less sloppiness than has ever been offered. The side ribs extend all the way back to the foot entrance. This supports the foot and reduces the flexure at the arch, eliminating cramping.

The buckles are new, easier to adjust, and non-sliping. Amazingly light, the Sea Wing sets a new criterion for fin efficiency.



A.I.R. II

A.I.R. II (alternate inflator/regulator) combines a power inflator and second stage regulator. It offers easy access because of its consistent position on your buoyancy device. The A.I.R. II design eliminates a low pressure hose, reducing clutter for the diver and the possibility of debris or sand accumulating in your safety system. Additionally, the A.I.R. II meets or exceeds standard requirements of certifying agencies. Order yours today from your local authorized SCUBAPRO dealer.



SCUBAPRO

Trivia Quiz



Illustration by Anita Schenck

Time for the sixth repetitive dive. We think you will find this round stimulating so hyperventilate, pop your ears and go for it.

Hey, we need help. The Trivia Editor is running out of questions. Send your suggestions to: Trivia Editor, c/o S.E.A. SCUBAPRO Education Association, 3105 E. Harcourt St., Rancho Dominguez, CA 90221.

1. Let's start this out at a high intellectual level and we'll go down from there. What classic novel of the sea begins with the phrase, "Call me Ishmael?"

2. Water is how many times denser than air?

- a) 200
- b) 400
- c) 600
- d) 800

3. Tunas have two kinds of swimming muscle, red and white, which makes them both springer and marathoner. Which color muscle is designed for endurance and long distance cruising?

4. With what diving malady is Martini's Law connected?

5. Dugongs inhabit the Indian Ocean and feed mainly on seaweed. They are related to?

- a) sharks
- b) sea turtles
- c) manatees
- d) whales

6. Let's see if you paid attention last time. Under ideal conditions kelp grows 18 to 24 inches per:

- a) day c) month
b) week d) year
-

7. The storage and maintenance for diving equipment includes three basic tenets. Can you get all three?

- a) rinse in _____
b) store in a _____, _____ place.
c) keep out of _____
-

8. Martini's Law: the mental effects of each additional _____ feet of depth are approximately equivalent to those of one dry martini.

9. Famous underwater photographers, Chuck Nicklin, Marty Snyderman, Howard Hall and the late Lamar Boren are all from the same city. What city?

10. What diving equipment accessory is an appropriate second word after all of the following parts of the anatomy? Leg, chest, heel, wrist, crotch.

11. What is the original nationality of each of these famous international divers?

- a) Jacques Costeau c) Gustav Dalla Valle
b) Hannes Keller d) Jacques Mayol
-

12. OK, deep thinkers. Name three types of depth gauge "mechanisms."

13. Diving acronym time:

- a) U.D.T. _____
b) P.S.I. _____
c) N.A.C.D. _____
-

14. What is the most obvious external difference between sea snakes and land snakes?

15. You get lots of bonus points if you can name the city in California where SCUBAPRO is located.

16. Here is a genuine "trivia" question. In malacology, TRIVIA is both the generic and common name for a group of small marine _____.

17. From Exodus 7:21, "all the waters that were in the river turned to blood. And the fish that were in the river died, and the rivers stank, and the Egyptians could not drink of the water of the river." This is the first historical reference to what marine occurrence?

18. True or false? All true jellyfish are venomous.

19. Divers in certain parts of the world search for amphorae. What is an amphora?

20. Fun time. If you ace this you get a PhD in Diving. Who was the first diving instructor? Clue: He introduced the first short, short course.

SCUBAPRO reserves the right to be wrong. We think we are correct but if you feel we have blown one, let us know. Check your answers against the ones on page 76. Now total your correct answers. If you scored:

0-5 Don't go near the water

6-10 You suffer from Martini's Law

11-15 You are a certified deep thinker

16-20 You should be asking us questions



Photo by Cathie Cosh

National Park Service archaeologists are documenting the many wrecks off California's Channel Islands.



Pacific Mail Steamship Cuba grounded off San Miguel Island in 1923.

Photo Courtesy Santa Barbara Historical Society

As many an old tale begins, it was a dark and foggy night. Captain Simon E. Blunt piloted his 280-foot steamship southward. Dead reckoning plotted the course of the *Winfield Scott*, its 500 passengers, mail and gold to be mid channel between Santa Cruz and Anacapa Islands. The vessel's powerful new engines and huge side wheel churned the sea pushing the ship, its crew and cargo through the pea soup blackness. Passengers, secure in the Master's seamanship, retired for the evening. Few were awake save for those on the bridge and several sweating firemen in the engine room. It was 11 p.m., December 1, 1853.

Suddenly, and without warning, the *Scott* tremored as she rammed an unseen object. Water gushed through two large holes in her bow. The *Winfield Scott* was hard upon the rocks. Frantically the helmsman shifted signals on the telegraph, giving the boiler room the order to reverse engines. Backing off, the ship lost her rudder. Losing control, she stuck again. Pandemonium broke out below decks as the lesser paying steerage passengers sought escape from the ships bowels. The once proud Pacific Mail steamship became hopelessly stranded. Captain Blunt gave the order to abandon

Darren Douglass is the author of over 30 articles and photo essays. His work has appeared regularly in diving magazines. Darren is also the editor of *Discover Diving*.

ship. An unruly mob of men surged toward the lifeboats, only to be held at bay by the revolvers of Captain Blunt and his first mate. Officers ferried passengers and provisions ashore in the darkness. Through Captain Blunt's courageous efforts all passengers landed safely without loss of a single life. The *Scott*, however, was wedged perilously on the rocks, eventually to be battered into oblivion by powerful Pacific swells.

Once on the beach, crude shelters were erected as the castaways awaited rescue for several days. The marooned passengers watched as the sea smashed mercilessly onto the wreck. Before long, nothing remained.

The *Winfield Scott* was the first major steamship to wreck at the Channel Islands. Lying along an exploration and trade route, these islands off the California coast with their sudden fog, fierce gales, and submerged rocks were, at times, a mariner's nightmare. The Spaniards lost several galleons during the early days of coastal exploration and trade in the Pacific. In the 1850's, the onset of the gold rush caused thousands to flock to the mines of the Mother Lode. For some, the voyage met with an unexpected interruption on the rocky shores of the Channel Islands.

Today, the National Park Service (NPS) is surveying and assessing the wrecks in the Channel Islands waters. Intensive study is being done on known wrecks, and Park Service archaeologists are hopeful as to what they may find in the process. It is believed some previously undiscovered wrecks may be located.

As wreck sites are determined, Park Service underwater archaeological teams will assess the condition of each and document the area through varying non-destructive techniques. Divers will photograph, sketch, measure, map and video the site extensively. Later, all the pieces of the underwater puzzle will be put together, resulting in a piece by piece map of the wreck, listing its condition and identifying its major features. Much of this information will be used in later archaeological study and will be helpful in monitoring preservation efforts. By-products of the survey include benefits to divers such as the resulting area maps.

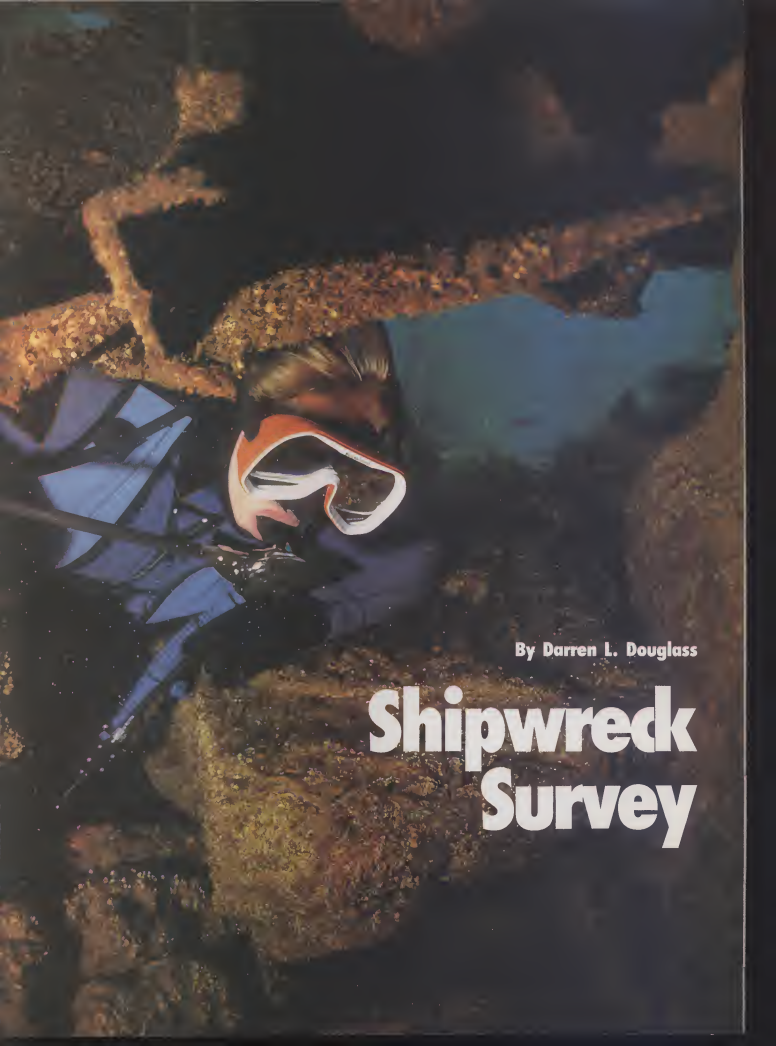
With these drawings, divers will be able to identify major portions of the wreck, as well as determine the location of outlying pieces. As many charter dive boats visit these wrecks, Park officials are planning to place mooring buoys over various sites to eliminate damage currently being caused by anchoring vessels.

But time, anchors and winter storms are not the only causes of shipwreck deterioration. Salvors and divers have been picking away at these wrecks for many years, although it is illegal to do so. Many artifacts have come up; portholes, brass spikes, hatch covers and other objects made of brass and copper. NPS Underwater Archaeologist Don Morris hopes that documentation and education efforts will help preserve these wrecks for future divers to enjoy. Morris also hopes to embark on research programs that will include the use of volunteer sport divers. The Park Service has used knowledgeable local divers to assist in past documentation and surveying efforts. This has already proved successful at Isle Royal National Park in Michigan.

"We need local expertise in support of this effort," maintains Morris. In citing a recent survey, Morris notes that there are over 90 known wrecks in Channel Island National Monument waters. "Certainly there are many more lying undiscovered, waiting to be found."

After historians and archaeologists completed primary research and background study, the NOAA research vessel *Fairweather* began conducting side-scan sonar and magnetometer searches in May of 1985, seeking to confirm reports of wrecks in specific areas.

Later, the NPS Submerged Cultural Resource Unit began its assessment of the *Golden Horn*, a large iron hulled barque that ran aground on the backside of Santa Rosa Island in 1892. Lost in the fog and without wind, the ship helplessly floated onto the rocky pinnacles inshore from Bee Rock. According to Morris, unit members made over 300 dives on the site within several days. A videotape documenting the wreckage will be made available to divers and non-divers at the Channel Island Visitor Center in Ventura. Extensive drawings of the wreckage are also available for viewing, offering a visual



By Darren L. Douglass

Shipwreck Survey

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California Wreck Divers Inc. Local wreck diving club. Contact Pat (213) 390-5171. Single day trips cost \$40, if not sold out to club members first.

Sport Chalet Divers. 920 Foothill Blvd., La Canada, CA 91011 (818) 790-2717. Single day trips: \$50. Specific wreck trips scheduled year-round.

Scuba Luv'er. 704 Thousand Oaks Blvd., Thousand Oaks, CA 91360 (805) 496-1014. Single day trips: \$45.

Barbara Marie Dive Boat. 2172 Pickwick Drive, Camarillo, CA 93010 (805) 484-1594. Wreck trips: \$40.

Atlantis Dive Charters. 22nd St. Landing, San Pedro, CA 90733 (714) 531-5582. Wreck trips: \$40 to \$55.

Scuba Queen Charters. 22nd St. Landing, San Pedro, CA 90733 (213) 691-0423. Wreck trips: \$35 to \$52.

Weather

This is rarely a preclusion for Southern California wreck diving activities. Diving is generally good year round, with spring perhaps being slightly inconsistent. If storms do move in, however, a good variety of wreck sites are available for alternate selection.

Dive shops in the SCUBAPRO Authorized Dealers listing in this magazine can assist any diver in planning a trip to the Channel Islands.

overview of the site.

Other wrecks involved in or targeted for study are:

Minesweeper sunk in 60 feet of water at Santa Cruz Island, Scorpion Anchorage. **AF-25 Grumman Guardian** trainer aircraft ditched south of Laguna harbor. 60 feet deep, Santa Cruz Island.

Crown of England steam screw driven ship at Ford Point, Santa Rosa Island. Ran aground 1894.

Cuba Pacific Mail Steamship. Ran aground at Point Bennett, San Miguel Island, 1923.

Aggi Norwegian four-masted barque, stranded on Talcott Shoal, Santa Rosa Island, 1915.

Fishing boats, lumber schooners, coastal freighters, passenger steamers,

barques, clippers, and many others make up the hit parade of distinguished and not-so-distinguished vessels that met their fate on the rocks, shoals and shores of the Channel Islands.

"Each of these older wrecks is its own time capsule," states Morris, who is quick to point out that the Channel Islands contain a bonanza of submerged archaeological treasures. "We can learn a tremendous amount about early West Coast culture from many of these wrecks."



Donkey engine used to salvage goods from grounded ship.

Morris maintains that divers and non-divers alike will benefit from the material uncovered during the shipwreck assessment project.

"The general public will be able to understand various periods of history through articles, displays and presentations, such as those available at the Channel Islands Visitor Center. Additionally, sport divers will have the opportunity to explore wrecks with greater understanding through NPS mapping efforts, marker buoys and trail sites such as the ones implemented at Isle Royal," Morris said.

After all of this, one might say, "What next; Spanish galleons, lost ghost ships, British frigates?"

For now, the Park Service will continue expanding its study with further historical research, mapping, step-by-step measurements, and community involvement.

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Back on Their Feet

By Tim Rock

A rusty hulk of a ship limped into port. Registered in Taiwan, the old boat wore its years at sea tiredly. Streaks of rust adorned its sides and the bridge was a bastion of chipped paint and fogged windows. The crew was sun-parched and tired. They had been on the ocean for months and had hoped to be on their way home. Just south of the Palau archipelago, near the island of Anguar, the old deisel sputtered and complained. After hours of work, it was obvious the ship would have to head to the nearest port for repairs. Sputtering toward Malakal Harbor, the captain sensed trouble but knew of no other way to solve his dilemma.

When customs and immigration officials boarded the aging vessel, they set about checking the ship's and the crew's papers. One officer wandered to the hold of the ship and lifted the hatch cover. He gasped when he saw the cargo. The interior was filled with the muscles of giant clams. Piled on top of them were turtles. They were green and hawksbill sea turtles, endangered species that only local islanders were allowed to hunt for subsistence.

Many of the green turtles were undersized, barely large enough to make a

single meal. Others were layers—female turtles capable of bearing eggs. In the hours of interrogation that followed, the captain revealed that he had stopped at Palau's southern islands of Tobl, Sonsoral and Helen Reef, breeding grounds for hawksbill turtles. The green sea turtles were taken from another uninhabited atoll in Palauan waters. The tridacna clams were killed only for their adductor muscle, the rest of the massive bivalve was left to rot.

In the days that followed, the ship was seized and the crew confined and eventually deported. The captain wired to his company for funds to pay a stiff fine and also left the country. Smart money bet the same captain and crew would soon be back on Palauan waters or those of some other small nation raiding the natural resources. Turtle meat and shell fetches a high price in Asian markets. The giant clam trade may be a billion-dollar business. The loss of the rusty scow and the fines imposed was a mere hand slapping for these sea pirates.

The depletion of the country's natural resources is a real concern to biologist Becky Madraisau. He is a fisheries specialist at Koror's Micronesian Mariculture Demonstration Center (MMDCC). It has already put Palau on the map for its work in giant clam reproduction. Now Becky is trying to make headway in raising the

hawksbill turtle at the facility.

"We hope to increase the population in the Rock islands," Madraisau says positively.

To do this, he and a team of biologists and volunteers have been making trips to the islands, which resemble a scattering of emerald mushrooms dotting the deep blue waters of central Palau. Some islands are composed of sheer limestone cliffs but others have secluded beaches and reaching bars of fine, tawny sand. It is here that the hawksbills come to lay their eggs in the late spring and early summer months.

Since 1982, workers have been collecting the eggs from the nests of the turtles and taking them back to their facility for incubation. It takes approximately 60 days for the young turtles to hatch from their sand-covered light boxes in the lab. Madraisau checks the unborn turtles daily, noting any change in the incubators. Cracks in the sand or raised lumps indicate something may be stirring. When the eggs hatch, he wants to be ready as dozens of miniature hawksbills will spill from their nest and instinctively head to the sea.

Walking along the series of tanks at the MMDCC, Becky points out the various stages of development in the turtles he is currently raising. Some are close to independence. Their shells are about the size

A free-lance photojournalist based in Guam, Tim Rock specializes in the Western Pacific area. His company, RVM, produces still and video material focusing on marine life of the Pacific.



Micronesian scientists are helping endangered turtles make a comeback



of a hubcap and they will soon be large enough to be released into the wild. They now recognize the presence of a human as that of the person who feeds them and pop their heads out of the water looking for a handout. Their movements are already smooth and graceful as they glide by to observe the situation.

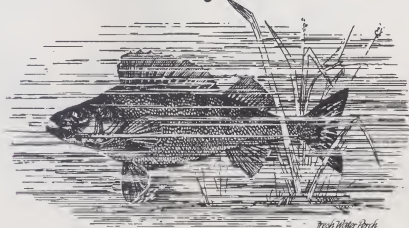
Born swimmers who only return to land to lay eggs, turtles have adapted to the ocean better than most reptiles. Their lung capacity allows them to remain submerged for more than an hour while active and as long as four hours while resting. They can also suck water into their mouths and absorb the dissolved oxygen through their nasal and oral membranes. Tear glands near their eyes are miniature desalination plants which remove the salt from the water the turtles take in with their food. Like salmon, turtles are known to migrate thousands of miles to return to the exact island, reef and beach where they hatched. They turn on their navigational computers after eight to ten years of maturation.

When Madraisau steps into the picture to retrieve the eggs that the turtles have traveled so far to deposit, he is doing the mother a favor. Within the first three days after a turtle has laid its eggs in the sand, predators ranging from wild dogs and pigs to man gobbles or snatch them. Oddly, it seems that after the first few days, the eggs are safe as animals then have much



Illustration by Apolinar Medina.

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more trouble finding the nest.

When the frenzied babies burst through the sand and head for the water, they are again faced by a host of predators, mainly sea birds and carnivorous fish. Since only about 30 to 40 percent of the hatchlings are able to dig their way out, their odds of survival have already been more than halved. After contending with birds, fish and other unfavorable conditions only about two to three percent will actually make it to six months of age.

At the MMDC, Madraisau points out the astonishing difference at the hawksbill survival rate when raised in captivity. The hatch rates increases 10 to 20 percent and instead of only 2 to 3 percent making it to age six months, 95 percent of the babies will grow to an age where their chances of survival are greatly increased. Since 1982, over 1,300 hawksbills have been raised at the lab.

The babies in the tanks at the far end of the holding system are almost as small as panted pet shop turtles. Their miniature antics capture the attention of visitors to the MMDC. Some remark that the little hawksbills are cute; others think they are kind of ugly. They are comical as they bump into each other and spin in circles. One reaches over and nibbles another's flipper. Another blows tiny bubbles.

Madraisau takes a handful and places them on the wire screen on top of the tanks. They sit motionless for a moment, then each and every one turns and heads toward the sea. He tries to point them toward the water in the holding tanks, but they still head to the sea. He points them completely away from the ocean but they eventually do a 180 and take off.

"It's natural," he tells me, "You can't fool them. They know where the ocean is."

And when this same instinct calls the grown hawksbills back to their birth beaches, Madraisau attempts to be there. He estimates that he is able to harvest about 20 percent of the nests he actually locates in the Rock Islands. "The rest are poached," he says, his expression turning somber.

The poaching he speaks of is done by other Palauans. Hawksbills are consumed as part of the traditional economy of Palau. But Becky points out the problem is that traditional ways of harvesting are giving way to the greed of the poachers. Even local people are taking the eggs, undersized turtles and layers. A black market for the eggs and other turtle products exists and many are ignoring the country's resources in favor of a quick buck.

Still, Madraisau feels he is making some gains in the preservation of the turtles in this country. This year he has instituted a tagging program designed to enable him to better understand turtle behavior and at the same time document the effects his program might be having

on future mating and laying.

When the turtles are to be set free, Madraisau returns to the exact island, the exact beach, the exact spot where he got their mother's eggs months prior. He releases them here in hopes that he can maintain their balance with nature. The tagging started only recently, 231 individuals carry them, so it may be at least five or six years before he finds out if his incubated babies will return as they would have had they been born in nature.

Madraisau is a strong proponent of conservation, enforcement of protective laws and education of the young to allow them to appreciate their country's resources. The funding for his ongoing project comes from a Japanese group known as the Nippon Turtle Shell Association. It is interested in the farming aspects of raising the hawksbill, Madraisau says, and the eventuality of developing a 50 percent release—50 percent slaughter arrangement. But now, farming is still on a proposal basis and bolstering the Rock Island wild hawksbill population is the main goal of the MMDC.

A few days after visiting the turtle project, I was scuba diving in Palau along an outer reef area known as Rebotel. I was the first in my group to slip over the side of the boat. Floating down along the gently sloping coral I spotted the familiar form of a large hawksbill. A Palauan friend once told me that if I wanted to get close to a turtle, I had to look like a turtle. I've never been sure whether he was pulling my leg or not, but the method seems to work.

Tucking my elbows in at my side and slowly fanning my arms, I moved slowly toward the reptile. This one had been around for a while. His head and flippers were scarred and barnacles grew in various places. A coating of algae graced his huge carapace. He watched me calmly, perhaps in awe or amusement, as I approached his resting place. I guess I was about six feet away when I stopped to observe him. His wrinkled neck craned a little from the shell and his sleepy eyes blinked as we watched each other.

I finally exhaled a telltale stream of bubbles and the spell was broken. He rose slowly, gracefully and with a powerful stroke from his huge front flippers he began to soar. He headed up the reef slope as the sun spilled rays through the blue water, silhouetting his rise. As he was beginning to disappear from sight, he turned and began to soar. He headed back my way like a marine hanglider forming a high arc over my head. He seemed to hang motionless for a moment and then, with quick strokes he shot down over the edge of a coral wall disappearing into the depths.

It is Madraisau's hope that this turtle and others for generations to come will grace the abundant reefs of Palau. \$

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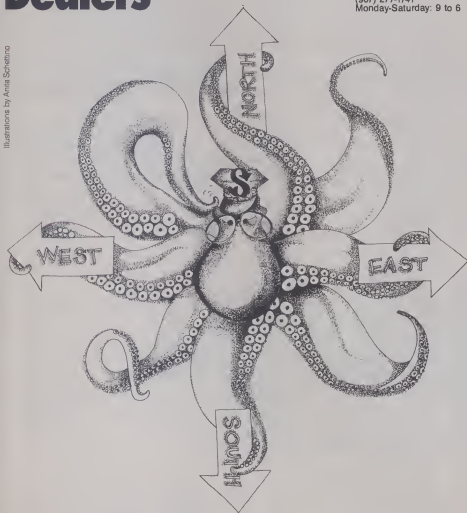
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Illustrations by Anna Schelling



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Belmont Shore 90813

(213) 434-1604

Monday-Thursday: 10 to 6:30

Friday: 10 to 7, Sat.: 9 to 6

Sunday: 9 to 5

Pacific Sporting Goods

1719 S. Pacific Ave.
San Pedro 90731

(213) 833-2422

Monday-Thursday: 10 to 6:30

Friday: 10 to 7, Sat.: 10 to 6

Sunday: 9 to 5

Peninsula Diving Center

1015 W. El Camino Real
Mountain View 94040

(415) 985-2241

Tuesday-Friday: 10:30 to 7

Saturday: 10 to 5

The Pinnacles Dive Center

875 Grant Ave.
Novato 94947

(415) 897-9962

Monday-Friday: 10 to 7

Sat. & Sun.: 8 to 4

The Pinnacles Dive Center

2100 Armory Dr.
Santa Rosa 95401

(707) 542-3100

Monday-Friday: 10 to 7

Sat. & Sun.: 8 to 4

San Diego Divers Supply

4004 Sports Arena Blvd.
San Diego 92110

(619) 224-3439

Monday-Thursday: 9 to 7

Friday: 9 to 9

Sat. & Sun.: 8 to 8

Scuba Dubs Dive Shop

7126 Reseda Blvd.
Reseda 91335

(818) 881-4545

Monday-Saturday: 10 to 7

Scuba Haus

2501 Wilshire Blvd.
Santa Monica 90403

(213) 828-2916

Monday-Thursday: 10 to 6

Friday: 10 to 7

Sat.: 10 to 6, Sun.: 12 to 5

Scuba Toys

9547 Valley View Ave.
Cypress 90630

(714) 527-0430

Monday-Thursday: 10 to 7

Friday: 10 to 9

Sat.: 10 to 7, Sun.: 10 to 6

Scuba Toys Too

1640 W. Lincoln
Anaheim 92801

(714) 556-5540

Monday-Thursday: 12 to 7

Friday: 12 to 8

Sat. & Sun.: 8 to 6

Scuba Ventures

2222 E. Cliff Dr.
Santa Cruz 95062

(408) 476-5201

Monday-Thursday: 9 to 5

Saturday & Sunday: 8 to 8

Friday: 9 to 6

Southern Calif. Diving Center

1121 S. Glendora Ave.
West Covina 91790

(818) 338-8863

Monday-Saturday: 9 to 7

Sport Diving West, Inc.

11501 Whittier Blvd.
Whittier 90601

(213) 692-7373

Monday-Friday: 10 to 8

Saturday: 10 to 6

Sports Cove

896 Alamo Dr.
Vacaville 95568

(707) 448-9454

Monday-Friday: 10 to 8

Sat.: 10 to 6, Sun.: 12 to 5

The Stalker

8065 Greenback Ln.
Citrus Heights 95610

(916) 481-5286

Monday-Friday: 10 to 9

Saturday: 10 to 6

Sunday: 12 to 5

St. Thomas

1432 Clovis Avenue
Clovis 93612

Denver Divers Supply

557 Milwaukee
Denver 80206
(303) 399-2877
Monday-Friday: 10 to 7
Saturday: 10 to 6

Diver's Reef

3014 N. Nevada
Colorado Springs 80907
(303) 634-3386
Monday-Saturday: 10 to 6

Rocky Mountain Diving & Sailboat Center

1737 15th St.
Boulder 80302
(303) 449-9606
Monday-Friday: 10:30 to 8:30
Saturday: 10 to 5

CONNECTICUT

Swim & Dive Center (Multi-Tech)
190 Flanders Rd.
Niantic 06357
(203) 739-9596

DISTRICT OF COLUMBIA

National Diving Center
4932 Wisconsin Ave. N.W.
Washington D.C. 20016
(202) 363-6123
Monday-Friday: 9 to 8
Saturday: 9 to 5
Sunday: 10 a.m. to 4 p.m. (5:30 to 10:30)

FLORIDA

ABC Sports Inc.
1915 Linhart
Fl. Myers 33901
(813) 334-4616
Monday-Friday: 10 to 5:30
Saturday: 10 to 3

Adventure Scuba
150 N. U.S. Hwy. 1
Tequesta 33458
(305) 746-1555
Monday-Friday: 10 to 6
Saturday: 8 to 6
Sunday: 8 to 3

Ameri Dive
7166 Biscayne Way
Tampa Beach 33633
(305) 385-4407
Daily: 9 to 7

American Diving Headquarters Inc.
Route 1, Box 2748
Key Largo 33037
(305) 451-0037
Daily: 7:30 to 6

Aqua Den Scuba
9469 S.E. Hwy. 441
Ocala 32671
(904) 245-5567
Closed Tuesday
Other Days: 10-7

Aquanauts South
915 S.W. 87th Ave.
Miami 33174
(305) 262-9295
Monday-Saturday: 9 to 7

AquaShop
505 Northlake Blvd.
North Palm Beach 33408
(305) 848-9042
Monday-Friday: 9:30 to 6:30
Saturday: 7 to 6
Sunday: 7 to 4

Aquatic Center Inc.
2126 S.W. 34th St.
Gainesville 32608
(904) 377-DIVE
Monday-Saturday: 10 to 7

Buddy's Dive Shop
M.M. 80 Overseas Hwy.
Islamorada 33036
(305) 664-4704
Daily: 8 to 6

C & G Sporting Goods Inc.
137 Harrison Ave.
Panama City 32401
(904) 769-2317
Monday-Saturday: 8:30 to 5:30

Coastal Sport & Diving

2407 10th Ave. North
Lake Worth 33460
(305) 965-0524
Monday-Saturday: 10 to 7
Sunday: 7:30 to 2

D & S Diving

225 E. Brandon Blvd.
Brandon 33511
(813) 681-1961
Mon., Wed., Fri. & Sat.: 10 to 6
Tues. & Thurs.: 10 to 9

Dive Shop II

301 E. Blue Heron Blvd.
Riviera Beach 33404
(305) 848-7632
Monday-Friday: 8 to 5:30
Saturday & Sunday: 7 to 5:30

Hal Watts Mr. Scuba
2215 E. Colonial Dr.
Orlando 32803
(305) 896-4541
Monday-Friday: 1 to 6:30
Saturday: 9 to 6

Hall's Dive Shop

1688 Overseas Hwy.
Marathon 33050
(305) 743-5929
Daily: 9 to 6

Island Dive, Inc.

241 N. Collier Blvd.
Marco Island 33937
(813) 394-9777
Monday-Saturday: 9 to 6
Sunday: 9 to 6

Jensen Beach Divers

1991 Northeast Dixie Hwy.
Jensen Beach 33457
(305) 334-7333
Daily: 9 to 6

Key West Pro Dive Shop, Inc.
1605 N. Roosevelt Blvd.
Key West 33040
(305) 296-3823
Monday-Saturday: 9 to 6

Ocean Pro Dive Shop Inc.
2255 Bee Ridge Rd.
Sarasota 33582
(813) 924-3483
Monday-Thursday: 10 to 6
Friday: 10 to 9
Saturday: 9 to 6

Panama City Dive Center
4823 Thomas Drive
Panama City
(904) 235-3390
Daily: 9 to 6

Scuba Shop

230 N. Eglin Parkway
Fort Walton Beach 32548
(904) 963-1341
Sunday-Friday: 9 to 5
Saturday: 8 to 6

Scuba-Ski Inc.

118 9th St., South
Naples 33940
(813) 262-7389
Monday-Saturday: 10 to 6
Sunday: 10 to 6

Seabaworld of Tampa Inc.
9010 Sheldon Rd., Suite 500
Tampa 33615
(813) 960-1130
Sea Center Dive Shop
501 29th St. U.S. 1
Big Pine Key 33043
(305) 872-2319
Daily: 8 to 6

Skippers Diving Center
408 E. Wright St.
Pensacola 32501
(904) 434-0827
Summer/Daily: 9 to 6
Winter/Closed Sunday

Submariner

940 N.E. 20th Ave.
Fort Lauderdale 33304
(305) 522-7722
Monday-Friday: 10 to 6
Saturday: 9 to 5

Tackle Shack

7601 66th St. North
Pinellas Park 33565
(813) 546-5080
Monday-Saturday: 10 to 7
Sunday: 9 to 5

U.S. One Scuba Inc.

15 North Federal Hwy.
Pompano Beach 33060
(305) 946-6055
Monday-Friday: 10 to 6
Saturday: 9 to 5
Sunday: 9 to 3

Vortex Springs

Route 2, Box 18A
Ponce de Leon 32455
(904) 836-4978
Monday-Thursday: 7:30 to 5
Friday-Sunday: 7 to 7

GEORGIA

Dive Sales, Inc.
1925 Piedmont Circle
Atlanta 30324
(404) 872-6448
Monday-Friday: 10 to 6
Saturday: 10 to 2

Diving Locker

42 W. Montgomery Cross Roads
Savannah 31416
(912) 827-6603
Daily: 10 to 6

Planet Ocean Scuba Center

Windsor Village Shopping Center
Columbus 31909
(404) 563-8675
Monday-Friday: 10 to 6:30
Saturday: 10 to 5

Sharbon's Specialty Sports

850 Hawthorne Avenue
Athens 30606
(404) 546-7225
Saturday & Wednesday: 9:30 to 6
Thursday & Friday: 9:30 to 8

HAWAII

Aloha Dive Shop

Kolo Marina Shopping Center
Honolulu, Oahu 96825
(808) 395-8882, 5922
Daily: 8 to 5:30

Aquatics Kauai Ltd.

4733 Kuhio Hwy.
Kapaa, Kauai 96746
(808) 822-9213
Monday-Saturday: 8:30 to 5:30
Sunday: 9 to 5

Central Pacific Divers

780 Front St.
Lahaina, Maui 96761
(808) 661-4661
Daily: 7 to 9

Hawaiian Divers

4510 Salt Lake Blvd., Suite D7
Honolulu, Oahu 96816
(808) 845-6644
Monday-Friday: 9 to 5
Sat.: 8 to 6 Sun.: 8 to 4

Kohala Divers, Ltd.

P.O. Box 4935
Kawaihae 96743
Daily: 7 to 5

Kona Coast Skin Diver Ltd.

75-5514 Palani Road
Lahaina, Maui 96761
(808) 661-4505
Daily: 8 to 9:30

Leward Dive Center

85-978 Farrington Hwy.
Wainae, Oahu 96792
(808) 695-3414
Daily: 8 to 5

Maul Dive Shop

P.O. Box 1018 Aiea Pl.
Kihei, Maui 96753
(808) 879-3388
Monday-Friday: 8 to 9 p.m.
Sat. & Sun.: 8 to 6

Ocean Activities Center

3750 Waiala Alanui D2
Wailea, Maui 96753
(808) 879-4485
Daily: 9 to 6

Rainbow Divers

1652 Wilikina Dr.
Wahiawa, Oahu 96786
(808) 822-4532
Monday-Friday: 9 to 6
Sat. & Sun.: 8 to 6

Scuba Schools of Maui & Kona

1000 Limahane Place
Lahaina 96761
(808) 661-9036/329-2661
Daily: 7:30 to 5:30

Sea Paradise

P.O. Box 5655
Kailua-Kona 96740
(808) 322-2500
Daily: 7:30 to 5:30

Sea Sage

4-1378 Kuhio Hwy.
Kapae, Kauai 96746
(808) 822-3841
Daily including holidays: 8:30 to 5

Ocean Adventures

406 Kam Hwy.
Pearl City, Oahu 96782
(808) 487-9060
Monday-Sunday: 8 to 6
Sunday: 8 to 4
Closed Wednesday

South Seas Aquatics

1050 Ala Moana Blvd.
Honolulu 96734
(808) 538-3854
Monday-Friday: 10 to 9
Saturday: 10 to 5
Sunday: 10 to 4

Waikiki Diving, Inc.

420 Naha St.
Honolulu, Oahu 96815
(808) 922-7188, 7189
Monday-Friday: 8 to 6
Sat. & Sun.: 8 to 5

IDAHO

The Scuba Diving Co.

219 W. 37th St.
Boise 83714
(208) 344-7730
Daily: 9:30 to 4:30

ILLINOIS

Anchor International Inc.

315 W. Ogden Ave.
Westmont 60559
(312) 971-1060
Monday-Friday: 12 to 9
Saturday: 10 to 5, Sunday: 10 to 3

Anchor International

1790 Algonquin Rd.
Arlington Heights 60005
(312) 253-1960
Mon., Tues., Thurs., Fri.: 5 to 9
Sat.: 10 to 5

The Scuba Shop Inc.

800 Roosevelt Rd., Bldg. D-104
Glen Ellyn 60137
(312) 858-4485

IOWA

Dubuque Yacht Basin

1630 E. 16th St.
Dubuque 52001
(319) 556-7708
Monday-Friday: 10 to 6
Saturday: 10 to 3

Iowa State Skin Diving

Schools, Inc.
West University Plaza
7500 W. University Ave., Suite C
Des Moines 50311
(515) 255-0001
Mon., Wed., & Fri.: 10 to 7
Saturday: 10 to 6

INDIANA

Divers Supply Company, Inc.

3301 N. Illinois St.
Indianapolis 46208
(317) 923-5335
Mon., Wed. & Fri.: 9 to 7:30
Tues. & Thurs.: 9 to 5:30
Saturday: 9 to 5

Divers World

1271 E. Morgan Ave.
Evansville 47711
(812) 423-2739
Monday-Friday: 10 to 6
Saturday: 8 to 5

Pro Dive Shop
3203 Covington Road
Fl. Wayne 46804
(210) 432-7745
Mon., Tues., Thurs. & Fri.: 12 to 6
Saturday: 9 to 1

Underwater Adventures, Inc.
1509 Goshen Road
Wayne 46808
(219) 484-1456
Monday-Friday: 11 to 7
Saturday: 9 to 5

KANSAS

Adventure Sports
East Side Britanny Shopping Center
2120 N. Woodward #370
Wichita 67208
(316) 689-8052
Daily: 10 to 6

The Dive Shop
3508 W. 95th St.
Leawood 66208
(913) 381-4400
Daily: 10 to 7

Snufflower II
208 West B Street
Ellinwood 67526
(316) 564-2088
Monday-Saturday: 2 to 7

KENTUCKY

Divers, Inc.
4807 Dixie Hwy.
Louisville 40216
(502) 448-7433
Monday-Friday: 10 to 7
Saturday: 10 to 5

Lexington Dive Shop
819 Euclid Ave.
Lexington 40502
(606) 266-4703
Monday-Friday: 11 to 7
Saturday: 11 to 5

Louisville Dive Shop
2478 Bardstown Rd.
Louisville 40205
(502) 458-8427
Monday-Friday: 11 to 7
Saturday: 11 to 5

LOUISIANA

Adventure Sports Inc.
1817 Texas Ave.
Shreveport 71103
(318) 425-5870
Monday-Saturday: 10:30 to 6:30

Bayou Ventures Inc.
809 Brashear Ave.
Morgan City 70381
(504) 385-3483
Monday-Friday: 9 to 5
Saturday: 9 to 12

Houma Watersports
3219 W. Main
Houma 70360
(504) 879-2900
Monday-Friday: 10 to 6
Saturday: 10 to 3

Sea Horse Diving Academy
5400 Crowder Blvd., Unit "E"
New Orleans 70127
(504) 248-6523
Monday-Friday: 11 to 7
Saturday: 10 to 6

SEVEN SEAS

633 Oak Villa Blvd.
Baton Rouge 70815
(504) 826-1819
Monday-Saturday: 9:30 to 5:30

Vineyards Dive Shop
1400 W. Esplanade Ave., Unit E
Kenner 70065
(504) 469-3483
Monday-Friday: 10 to 7
Saturday: 10 to 6

MAINE

Aqua Diving Academy
1183 Congress St.
Portland 04101
(207) 772-4200
Monday-Saturday: 10 to 5

Skin Diver's Paradise
RFD #3, Turner Rd., Box 817
Auburn 04210
(207) 782-7729
Monday-Friday: 2 to 9
Saturday: 7 to 6

MARYLAND

Bethany Water Sports
3220 Corporate Ct. Suite G
Ellicott City 21043
(301) 461-DIVE
Monday-Friday: 10 to 7
Saturday: 10 to 5

Divers Den Inc.
8105 Harford Rd.
Baltimore 21234
(301) 668-6866
Mon., Tues., Thurs. & Fri.: 9:30 to 9
Wed. & Sat.: 9:30 to 5

DIVERS WORLD

971 Salm Road
Silver Springs 20910
(301) 587-7794
Monday-Friday: 10 to 9
Saturday & Sunday: 9 to 6

THE SCUBA HUT, INC.

139 Delaware Avenue
Glen Burnie 21061
(301) 761-4520
Mon., Wed. & Fri.: 10 to 8
Tuesday & Saturday: 10 to 6

TIDE WATER AQUATICS

1315 Forest Dr.
Annapolis 21403
(301) 268-1992
Monday-Friday: 11 to 7
Saturday: 11 to 5

MASSACHUSETTS

Aquarius Diving Center Inc.
3239 Cranberry Hwy.
Buzzards Bay 02532
(617) 759-DIVE
Monday-Friday: 10 to 7
Saturday: 8 to 4

LOWELL SCUBA CENTER

477 Gorham St.
Lowell 01852
(617) 453-7574
Monday-Friday: 11 to 7
Saturday: 11 to 5:30

ULTRAMARINE DIVERS

94 Commonwealth Ave.
Concord 01742
(617) 369-1154
Daily: 10 to 8

UNITED DIVERS, INC.

59 Washington St.
Somerville 02143
(617) 666-0410
Monday-Friday: 10 to 8,
Saturday: 9 to 6
Summer/Sunday: 9 to 4

WHALING CITY DIVING CENTER

39 Main St.
Fairhaven 02719
(617) 992-2662
(Winter) Monday-Friday: 4:30 to 7:30
Sat.: 10 to 4, Sun.: 9 to 12
(Summer) Monday-Friday: 10 to 7:30
Sat.: 9 to 5, Sun.: 9 to 1

MICHIGAN

Kalamazoo Dive Center

1622 Bloomfield Ave.
Kalamazoo 49001
(616) 345-2060
Monday-Friday: 10 to 7
Saturday: 10 to 5

Divers Incorporated

3380 Washtenaw Avenue
Ann Arbor 48104
(313) 971-7771
Monday-Friday: 10 to 6
Saturday: 10 to 5
Closed Tuesday & Sunday

Recreational Diving Systems

4424 N. Woodward
Royal Oak 48072
(313) 549-0303
Monday-Friday: 10 to 7
Saturday: 10 to 5

Scuba North, Inc.

13258 W. Bayshore Dr.
Troyersville City 49884
(616) 947-2520
Monday-Thursday: 9 to 6
Friday-Saturday: 9 to 7
Sunday: 10 to 5
(Winter) Mon-Sat.: 10 to 6

THE SCUBA CENTER-DIVERS SUPPLY

G-4155 Fenton Rd.
Burlington 48529
(313) 767-DIVE
Mon. & Thurs.: 8:30 to 6
Thurs., Wed., Fri., Sat.: 8:30 to 8

THE SCUBA SHACK

9982 W. Higgins Lake Dr.
Higgins Lake 48527
(517) 821-6477
(Summer) Monday-Friday: 9 to 5
Saturday & Sunday: 8 to 8

SEASQUATICS, INC.

979 S. Saginaw Road
Midland 48640
(517) 835-6391
Monday-Friday: 10 to 6
Saturday: 10 to 5

SKAMT SHOP

5055 Plainfield N.E.
Grand Rapids 49505
(616) 364-8418
Monday, Wednesday, Friday: 10 to 9
Tuesday, Thursday, Saturday: 10 to 6

TOM & JERRY'S SKIN

& Scuba Shop
20316 Van Born Ave.
Dearborn Heights 48125
(313) 278-1124
Monday-Friday: 11 to 7
Saturday: 11 to 5

ZZ UNDER WATER WORLD, INC.

1806 E. Michigan Avenue
Lansing 48912
(517) 485-3894
Monday-Friday: 10 to 7
Saturday: 10 to 5

MINNESOTA

Central Minnesota Divers
102 E. St. Germain
St. Cloud 56301
(612) 252-7572
Monday-Friday: 10 to 7
Saturday: 9 to 5

CLUB SCUBA EAST

2280 Maplewood Dr.
Maplewood 55109
(612) 484-7252
Monday-Friday: 10 to 8
Saturday: 10 to 5
(Summer) Sunday: 9 to 1

CLUB SCUBA WEST

1300 E. Wayzata Blvd.
Wayzata 55391
(612) 473-2266
Monday-Friday: 10 to 8
Saturday: 10 to 5
(Summer) Sunday: 9 to 1

MISSISSIPPI

Skippers Diving
4441 N. State
Jackson 39206
(601) 362-8969
Monday-Friday: 10 to 6
Saturday: 10 to 5

SOUTH MISSISSIPPI DIVE

& Sport Shop
Route 10, Box 418, Highway 19
Gulfport 39503
(601) 832-3193
Monday-Saturday: 8 to 5

MISSOURI

Divers Village
PO Box 329, Lake Road West 20
Lake Ozark 65049
(314) 365-3242
Daily: 9 to 6

JOHN THE DIVER

S.R. 1, Box 911
Branson 65616
(417) 338-2224
Daily: 8 to 8
Nov. through Feb. open by appt.

TABLE ROCK STATE PARK MARINA

S.R. 1, Box 911
Branson 65616
(417) 334-3069
Daily: sunrise to sunset
Nov. through Feb. open by appt.

THE DIVE SHOP NORTH

8135 North Oak
Kansas City
(816) 436-5448
Monday-Friday: 10 to 7
Saturday: 10 to 5

MONTANA

Mountain State Divers Supply

1525 Central
Billings 59102
(406) 252-7583
Monday-Saturday: 9 to 6

NEBRASKA

Action Sports 'N' Sail

325 N. 72nd Street
Omaha 68114
(402) 334-8420
Monday-Saturday: 10 to 7

Big Mac Scuba & Sail

Hwy. 61 & 92
Keystone 68144
(308) 726-2532
Monday-Friday: 8 to 5
Saturday & Sunday: 8 to 8

Fathom Dive

13 W. 18th
Scotts Bluff 68361
(308) 635-1556
Daily: 10 to 6

NEVADA

Desert Divers Supply

5720 E. Charleston Blvd.
Las Vegas 89122
(702) 438-1000
Monday-Friday: 8 to 6
Closed Tuesday
Saturday & Sunday: 7 to 8

Sierra Dive Co.

404 E. Grove St.
Reno 89502
(702) 825-2147
Mon., Tues., Thurs. & Fri.: 9 to 8
Wednesday: 9 to 9:30
Saturday: 10 to 5

NEW HAMPSHIRE

Atlantic Aqua Sports

522 Sagamore Rd.
Rye 03870
(603) 436-4443
Daily: 8 to 5, Closed Tues.

NEW JERSEY

Cedar Grove Divers Supply

492 Pompton Ave., Route 23
Cedar Grove 07009
(201) 857-1748
Tuesday-Friday: 12 to 9
Saturday: 10 to 5
Closed Sunday & Monday

Professional Divers, Inc.

70 Hwy. 35
Neptune City 07753
(201) 775-8292
Monday-Friday: 11 to 8
Saturday: 10 to 6
Sunday (Summer): 9 to 1

The Edison S/D Center

1659 Hwy. 27
Edison 08817
(201) 985-2206
Monday-Friday: 5 to 9:30
Saturday: 10 to 8

Underwater Sports Inc.

Box 17 South
Rochelle Park 07862
(201) 843-3340
Monday: 10 to 7
Tues.-Fri.: 10 to 9
Sat.: 10 to 6

Whitehouse Aquatic Center

Box 97-C, Hwy. 22 West
Whitehouse Station 08889
(609) 634-4090
Monday-Saturday: 10 to 8
Sunday: 10 to 2

NEW MEXICO

New Mexico School of Diving

4010 E. Main St.
Farmington 87401
(505) 325-2728
Monday-Saturday: 10 to 6

New Mexico Scuba Schools, Inc.

11200 Montgomery NE
Albuquerque 87111
(505) 292-7990
Monday-Saturday: 10 to 7

NEW YORK

Atlantis 2
438 Avenue of the Americas
New York 10011
(212) 924-7556
Mon., Thurs., Fri. & Sat.: 10 to 7
Tuesday & Wednesday: 12 to 7

Cougar Sports
917 Sawmill River Rd.
Ardley 10502
(914) 723-2286
Monday-Wednesday: 10 to 6
Thursday: 10 to 7, Friday: 10 to 8
Saturday: 10 to 5

King County Divers Corp.
2417 Avenue U
Brooklyn 11229
(212) 648-4232 & 934-4153
Monday-Friday: 2 to 9
Saturday: 10 to 9

Niagara Scuba Sports
2048 Niagara St.
Buffalo 14207
(716) 875-6529
Mon., Tues., Thurs. & Fri.: 9 to 8:30
Wed. & Sat.: 9 to 5:30
Sunday (June through September):
9 to 11:30

National Aquatic Service, Inc.
1732 Erie Blvd. East
Syracuse 13210
(315) 479-5544
Monday-Friday: 9 to 5
Saturday: 9 to 4

South Bay Diving Center
3028 Merrick Rd.
Wantagh 11793
(516) 785-3449
Monday-Friday: 12 to 8
Saturday: 10 to 6
Closed Sunday

Suffolk Diving Center
58 Larkfield Rd.
E. Northport 11731
(516) 261-4388
Monday-Thursday: 10 to 6
Fri.: 10 to 8, Sat.: 10 to 6
Sunday: 10 to 3

Swim King Dive Shop
Rt. 25A
Rocky Point 11778
(516) 744-7707
Monday-Friday: 10 to 7
Saturday: 8 to 6
Sunday: 8 to 12

Waterworld Connections
1222 Arterial Highway
Binghamton 13901
(607) 772-0106
Tuesday-Friday: 12 to 6
Saturday: 10 to 5

NORTH CAROLINA

Blue Dolphin Dive Shop
1006 National Hwy.
Thomasville 27360
(919) 475-2516
Monday-Thursday: 10 to 7
Friday: 10 to 9
Saturday: 8 to 6

Reef & Ridge Sports
532 E. Chatman St.
Cary 27511
(919) 467-3831
Monday-Friday: 11 to 6:30
Saturday: 11 to 3

Rum Runner Dive Shop Inc.
2717 E. 10th St., P.O. Box 3157
Greenville 27834
(919) 758-1444
Monday-Friday: 10 to 5

Sport Divers Inc.
2600 South Blvd.
Charlotte 28209
(704) 525-9234
Monday-Saturday: 9 to 6:30

OHIO

Buckeye Diving School
46 Warrensville Center Rd.
Bedford 44146
(216) 439-3877
Mon., Wed. & Fri.: 12 to 8
Tues. & Thurs.: 11 to 6
Saturday: 10 to 5:30

C & J Scuba
5825 North Dixie Dr.
Dayton 45414
(513) 890-6900
Monday-Thursday: 10 to 7
Friday: 10 to 9
Saturday: 10 to 5

Dale's Diving Shop Inc.
302 Maigs St.
Sandusky 44870
(519) 825-4134
10:30 to 5:30
Closed Wednesday and Sunday

Dive Inc.
428 Park Ave. West
Mansfield 44906
(419) 524-2484
Monday-Friday: 12 to 7
Saturday: 10 to 5

Divers Paradise
2511 N. Reynolds Rd.
Toledo 43615
(419) 535-6828
Monday-Friday: 11 to 7
Saturday: 10 to 5

Ka-Puka-Wai Dive Shop
1506 Whipple Ave. N.W.
Canton 44708
(216) 478-2511
Monday & Thursday: 11 to 9
Tues., Wed. & Fri.: 11 to 6
Saturday: 10 to 5

Sub-Aquatics Inc.
8855 E. Broad Street
Raynoldsburg 43068
(614) 864-1235
Monday, Tuesday: 10 to 5
Wednesday-Saturday: 10 to 7

Underwater Enterprises
832 Lake Ave.
Elyria 40335
(216) 323-9542
Monday-Friday: 9 to 9
Saturday: 9 to 6
Sunday: 9 to 11

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Oklahoma City 73116
(405) 840-1616
Monday-Saturday: 10 to 6

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Aquarius Too
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Klamath Falls 97601
(509) 884-3330
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Newport 97385
(503) 867-3742
Daily: 7 to 6

Northwest Divers Supply
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Bos City 97402
(503) 287-3723
Monday-Saturday: 9 to 6
Sunday: 9 to 1

Tri-West Diving School
13604 S.E. Powell
Portland 97236
(503) 761-5435
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Saturday: 10 to 5

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B & B Marine Specialties
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Hillsville 16132
(412) 667-9448
Daily: 9 to 7

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Sainbridge 17602
(717) 426-2114
Daily: 9 to 7

D.J. Hydro Sports
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Erie 16592
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Saturday: 9 to 4:30

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Springdale 15144
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Middletown 02840
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Sat.: 10 to 5:30

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North Augusta 29841
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Monday-Saturday: 10:30 to 6

Wateree Diving School & Equipment
3202 Fernandina Rd.
Columbia 29210
(803) 731-9344
Monday-Friday: 10:30 to 6:30
Saturday: 10 to 6

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Donovans Hobby & Scuba Center
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Sioux Falls 57105
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Tuesday & Thursday: 9 to 6
Saturday: 9 to 4:30

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Knoxville 37919
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Closed Sunday

Diving Adventures
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Nashville 37211
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Knoxville 37919
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Monday-Saturday: 10 to 6

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Galveston
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The Aquanaut
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Lubbock 79401
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Tuesday-Saturday: 11 to 5

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Beaumont 77706
(713) 832-0254
Monday-Saturday: 9 to 6

Copeland's
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Corpus Christi 78411
(512) 654-1135
Monday-Friday: 10 to 7
Saturday: 9 to 5

Del Rio Diving
P.O. Box 420564
Hwy. 90 West
Del Rio 78840
(512) 775-2949
Tuesday-Sunday: 7 to 5

Diver's Depot-I
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Nacogdoches 75961
(409) 564-9822
Monday-Saturday: 10 to 6

Divers Supply Co.
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Tyler 75702
(214) 533-2777
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Saturday: 9 to 2
Closed for lunch: 12 to 1

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12505 Highcroft
Houston 77035
(713) 721-7788
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Saturday: 10 to 4

Houston Scuba Academy
14609 Kimberly
Houston 77079
(713) 497-7651
Monday-Friday: 10 to 7
Saturday: 10 to 4

Houston Scuba Academy
17611 Kuykendahl
Spring 77379
(713) 320-0001
Monday-Friday: 10 to 7
Saturday: 10 to 4

School of Scuba
942 Walnut
Arlene 78001
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Fort Worth 76116
(817) 732-5761
Monday-Saturday: 10 to 6

Scuba West
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Arlington 76010
(817) 277-1122
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Dallas 75206
(214) 750-6900
Monday-Saturday: 10 to 6

Scuba West
9241 Skillman #104
Dallas 75243
(214) 348-8864
Monday-Saturday: 10 to 6

Scuba West
14902 Preston Rd., Suite 412
Dallas 75240
(214) 980-1300
Monday-Saturday: 10 to 6

Scuba West
12801 Midway Rd., Suite 401
Dallas 75234
(214) 241-2900
Monday-Saturday: 10 to 6

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125 West Bay Area Blvd.
Webster 77598-4111
(713) 338-1611
Monday-Friday: 10 to 7
Saturday: 10 to 6

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Waco 76710
(817) 772-6674
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Summer: 7 days

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San Antonio 78201
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Dive Utah
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Scuba Utah
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Salt Lake City 84119
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Saturday: 10 to 4

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Virginia Beach 23454
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Saturday: 9 to 6
Sunday: 9 to 4

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Chelan 98816
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Northwest Divers Inc.

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Puyallup 98371
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Monday-Saturday: 10 to 6

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Spokane 99207
(509) 326-4653
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Silent World Divers

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Bellevue 98005
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Saturday: 9 to 6

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Bremerton 98310
(206) 373-6141
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Saturday: 9 to 6

Sunday (April to Sept): 11:30 to 3

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Seattle 98133
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Sunday: 9 to 6

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Bennett Academy of Ski & Scuba

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Wauwatosa 53213
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Wed., Thurs. & Fri.: 10 to 9

Central Wisconsin Diving Academy

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Wisconsin Rapids 54494
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Friday: 9 to 9
Saturday: 9 to 5

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Wyoming Scuba Sports

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Saturday: 8 to 4
Sunday: 8 to 12

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Baja
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Cozumel, Q. Roo
01152987-20101 or -20661
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La Paz, B.C.S.
682-20719

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Cable: Itarukoror
Daily: 9 to 6

Water Sports, Inc.

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6664
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Calle Valle, Colombia
57 (93) 398024
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Honolulu, Solomon Islands
22103 or Telex HQ 66315
Daily: 8 to 5

Scubahire Ltd.

GPO Box 777
Suva, Fiji Islands
361-068
Daily: 8 to 5



By Mavis Hill

Celebrity Seafood Sampler



David Doublet

Dave Doublet, as a member of a very small group of highly sought after underwater photographers, is a contributor to the largest and most popular magazines in the world—the National Geographic Society magazine being an example. Needless to say, Dave is recognized the world over, not only by divers, but by anyone with even a smattering of interest in our underwater realm.

His expertise in his field is literally un-

surpassed. The uniqueness of concept he uses is readily reflected in his work. The accompanying photo is a self portrait.

Late last year, Dave did work for a *National Geographic* article about Australia's Great Barrier Reef around Heron Island, in the Coral Sea. Early this year, Dave worked in South Australia filming the Great White Shark, another *National Geographic* assignment for him. Then on to Bonaire, where he conducted an underwater photographic workshop through the Maine Photographic Workshops in Rockport, Maine. This past spring and summer was spent diving in the Red Sea and New Guinea, finishing up other projects for *National Geographic*.

Extensive traveling, writing, editing, and film processing keeps Doublet extremely busy. Yet he is the devoted husband of Ann Doublet, and his artistic success is almost overshadowed by his pride in their daughter, Emily. Now 2½ years old, Emily has been swimming since the age of four months, readying herself, we speculate, to someday compete with her father in the underwater world.

Dave's favorite seafood recipe is poached bass, served with hollandaise sauce.

Poached Bass with Hollandaise Sauce

2 pounds bass fillets

- 2 cups boiling water
- ¼ cup lemon juice or white wine
- 1 small onion, thinly sliced
- 1 teaspoon salt
- 3 peppercorns
- 2 sprigs parsley
- 1 bay leaf

Hollandaise sauce
Paprika

Cut fish into 6 portions and place in a well-greased, 10-inch frying pan. Add remaining ingredients. Cover and simmer for 5 to 10 minutes or until fish flakes when probed with a fork. Carefully remove fish to a hot platter. Pour Hollandaise sauce over, sprinkle with paprika (if desired) and serve at once.

Hollandaise Sauce

- ½ cup butter
- 4 egg yolks, well beaten
- 2 to 2½ tablespoons lemon juice
- Pinch of white pepper
- ¼ teaspoon salt

Melt 2 tablespoons butter in top of double boiler; pour gradually into beaten egg yolks, stirring constantly. Return to pan, place pan in or over hot water. Add remaining butter by tablespoons; stir after each tablespoon until melted. Remove from heat; stir in lemon juice, pepper, and salt.

Free-lance writer Mavis Hill specializes in diving, seafoods and sea life. She has authored over 200 articles on edible sea life, plus a book, "The Edible Sea."



Jack McKenney

Jack McKenney is one of the nicest people, in or out of diving, whom I've been my pleasure to know. He's also among the calmest and most efficient of divers, and certainly one of the most admired in the world of scuba and art of underwater photography.

Jack has been diving more than 30 years, having started in Canadian quarries, rivers and the Great Lakes. Since the beginning, this avocation steadily grew and took up more space in his life until it reached the proportions of his present day vocation, one of great magnitude.

Jack McKenney became well-known to many of the world's divers during his years of travel and diving as editor of a major underwater magazine. Divers and non-divers alike have seen and read and been fascinated by his magazine articles, underwater photos and movies, including his contributions to publications such as *National Geographic* and his participation in underwater film festivals.

Most divers are also acquainted with Jack McKenney's role as underwater cameraman and stuntman for such films as "The Deep," in which he also doubled for Nick Nolte, and Cornel Wilde's "Shark's Treasure." But what many divers admire (and envy!) was Jack's work diving on the Andrea Doria, for which he was lead underwater photographer for Peter Gimbel's TV special, one of the most exciting (and dangerous) projects in recent years. All together, Jack made 50 dives on the "Doria," and for the Gimbel special he was saturated for 17 days diving the Bank of Rome safe salvage at 235 feet.

McKenney's travels have taken him around the world, including Mexico, Canada, French Polynesia, the Virgin Islands, the Galapagos Islands, the Sea of Cortez, and the Philippines. From these areas he has also put together his "Dive To Adventure," a two-hour film presentation which is being enjoyed by prospective and veteran divers alike. The film reflects the unmatched, unique beauty and adventure

available to us in the underwater world at a variety of spectacular diving locations around the globe.

Jack McKenney, besides winning the 1980 World Shark Tagging competition with Chuck Nicklin, has been awarded such honors as Midwest Underwater Photographer of The Year from Universal Diving School of Chicago, the Boston Sea Rovers Diver of The Year award, and the Our World Underwater Award.

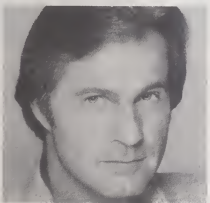
Jack lives in Southern California with his family and enjoys all seafoods; however, he says, "I guess my favorite is Calamari."

Squid Athenia

To clean a squid, hold the tubelike body in one hand and twist off the head with the other. This will pull out the viscera in one movement. Remove the long, clear shell. Grasp winglike fins and pull downward—the skin will come off with the fin. (Or use frozen squid!)

- 3 pounds cleaned squid
- 1 cup chopped onions
- 1 clove garlic, chopped
- 3 tablespoons olive oil
- 2½ cups chopped, canned tomatoes
- ½ cup chopped fresh parsley
- ½ teaspoon salt
- ¼ teaspoon pepper
- ¾ teaspoon crumbled oregano
- ¼ cup white wine

Remove tentacles. Chop: reserve. Wash mantle and cut into pieces. Sauté onions and garlic in oil until lightly browned. Add tomatoes, parsley, salt, pepper, oregano, wine, and squid. Cover; simmer 1 hour, until squid is tender. Serve with rice. Serves 4 or 5.



Gil Gerard

A native of Little Rock, Arkansas, Gil Gerard migrated to New York in order to follow his blossoming acting career; a vocation that now finds him one of the most popular television actors in the business. He is also an avid diver.

This energetic gentleman attends to a very busy acting schedule, plus producing films and running the business he

founded some time ago, "Prudhomme Productions." Prudhomme has made among other films, "Volpe: The Fox," the life story of New York art theft investigator Robert Volpe, a two-hour movie which Gil produced and in which he stars.

Recognizable due to their wide popularity, some of Gil Gerard's past movie roles have been in "Love Story," his first, which led to hundreds of TV commercials for him, and the title role in the "Buck Rogers in the 25th Century" series. Movies of the Week, and feature films. Others he has starred in are "Airport 77," "Little House On The Prairie," "Runaway," "For Love or Money," and "Stormin' Home." In February of this year, Gil starred in "The Last Electric Knight," which aired under The Disney Sunday movie banner. It is interesting that Gil started out as an industrial chemist and at one time was an advisor to Governor Winthrop Rockefeller, until he tired of the business world. Gil says he was simply not happy in it, and remembered how much he had enjoyed doing plays in high school and college.

Besides his diving avocation, Gil is deeply involved in helping the disabled by acting as National Chairman of the Multiple Sclerosis Read-A-Thon, and being active in the Special Olympics.

Gil has been married to Connie Sel-lecca, who stars on ABC-TV's hit series, "Hotel." In 1983, the two produced the Broadway musical, "Amen Corner."

Gil's favorite seafood is redfish (channel bass). He especially takes to the "Blackened Redfish" prepared at K. Paul's Louisiana Kitchen in New Orleans. Redfish is a very common and popular fish that schools or swims solitarily over sandy shores and bays on the Atlantic Coast from Delaware to Texas, entering both brackish and fresh water. It is reddish to brassy in color with a black spot above the caudal peduncle.

Creole Bass Fillets

- 1 medium onion, chopped
- ½ cup chopped celery
- 1 tablespoon butter
- 1 8 oz. can tomato sauce
- ½ teaspoon salt
- ½ teaspoon curry powder
- Dash freshly ground black pepper
- 1 cup chopped green pepper
- 2 pounds bass fillets

In large skillet, sauté onion in butter. Add the rest of ingredients, except fish. While mixture simmers, cut fish blocks into thirds (6 pieces). Put fish pieces into skillet side by side; do not pile them atop each other. Bring to boil. Reduce heat to simmer. Simmer 15 minutes or until fish flakes when probed with fork.

Note: This recipe is also delicious if finely chopped almonds are added to the sauce.

§

A first encounter with these gentle giants can be overwhelming.

One of the many joys of becoming a parent is to be able, once again, to see the world through a child's eyes. To share feelings, ideas and experiences with the young tends to rekindle one's own hopes and dreams.

My husband, John and I have been diving for many years and have introduced many new people, through instruction and tours, to the underwater world. We are always delighted to accompany new divers on their first underwater adventure, to let them see and touch the many wonders of the sea.

One evening last summer John and our son Dan, snuggled up for a nighttime book. Dinosaurs were on the agenda this evening. John began with an explanation of how millions of years ago dinosaurs populated the earth. It was not the simplest of tasks to try to explain to a six-year-old how something that once flourished on our planet could now be gone forever. John brought up the word extinct and to further explain, he used the manatee as an example. For years John and I had made an annual visit in December, to dive with the manatees. Dan had seen pictures that John had taken as far back as he could remember. It was just taken for granted that when Dan reached his twelfth birthday, the age on which we had agreed he could begin diving, he would be joining us. John went on to tell how the manatees were in danger of becoming extinct, suffering the same fate as the dinosaurs. They have no defense or protection from what is killing them. Many are injured or killed by surfacing in the path of oncoming boats. Much of their food source, water grasses, has been depleted by use of fungicides to clear the riverways for man's uses.

Steps are being taken by certain groups to try and protect these gentle animals, hopefully it isn't already too late. Danny became extremely quiet, and asked if they would all be gone before he was old enough to go with us. The truth of that statement suddenly struck John and he promised Dan that night he would be able to dive with the manatees.

The very next day plans for our vacation were under way. The manatees move up the Florida riverways during the winter

Suzanna and John Hall own Inner World Diving Centers in St. Louis, MO. Their articles and photographs have appeared in books, newspapers and magazines.



months in search of what they consider tepid waters, but to thin-skinned mammals, such as ourselves, it can become a virtual icebath. Wetsuits not only aid in keeping body heat in, but also add buoyancy to keep one comfortably afloat, so as not to frighten marine creatures with excessive treading. Off the rack wetsuits are not made to fit one as small as Dan, so measurements were taken and a custom suit ordered. Dan already had his own mask, fins and snorkel, which he was quite familiar with using.

In late November, we explained to Dan's teacher what we had in mind and along with her approval, we received enough homework to keep him up with his class. We arrived in Crystal River, Florida, midweek, to avoid the weekend rush. We had the river practically to ourselves. John skippered our small bass boat and we slowly made our way

through the crystal clear waters of the channels. Creatures were spotted darting quickly through the grasses below, but none were the size we sought. Danny and I were perched on the bow awaiting anxiously for our first sighting. After a short while, we spied a small object bob to the surface in the distance. As we approached we heard that familiar muffled snort, then saw a gentle spray of mist. We had found them! John quickly killed the motor and we slowly coasted the last few feet into the area. Dan's eyes were glued to the spot of our first sighting, but all that remained were a few dissipating ripples. A few moments later he wheeled around and shrieked with delight as he spied the small greyish mound on the surface. He had actually found his very own manatee! A block anchor was gently lowered and Dan was quickly suited up and ready to start his great adventure. We could tell the



Photos by John F. Hall

Through a By Suzanna J. Hall Child's Eyes



excitement was building, having witnessed the same symptoms many times, among our students in such classes. The adrenaline rush that urges you on to attempt the difficult, can work against you by becoming so intense as to make your imagination work overtime. Dan had worked himself up to this point and out of the blue proclaimed that seeing a manatee's nose was good enough for him and he would just as soon view the rest of it's body from the boat. We immediately recognized the apprehension and decided we had to take over from there. We had been in similar situations such as coaxing him through the removal of his first loose tooth. Strapping on his first skates was no different.

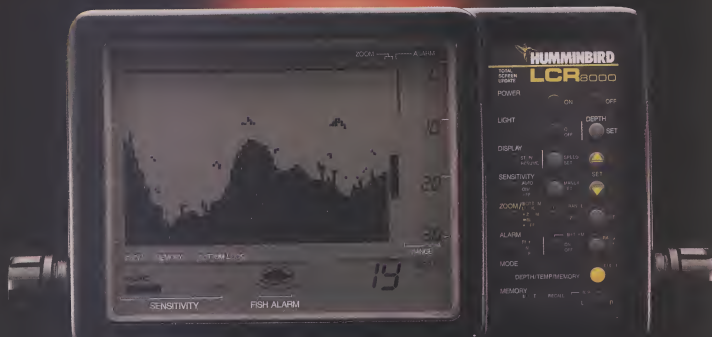
It took several minutes of reasoning, begging and threatening until Dan allowed John to lower him into the water to join me. I began to tread away from the boat

with this 50-pound weight wrapped around my neck, looking very similar, I'm sure, to the adult orangutan and its young at the zoo. After allowing Dan sufficient time to adjust to the water, I asked him to please loosen his grip a little from my throat, just enough so Mommy could breathe.

Danny, who had been diving in the ocean since he was two, and who had been in the same water with barracuda, rays and eels with little more than a comment on their location and movement, was now becoming fearful of an animal he knew would do no one harm. All he knew, for sure, was that there was something quite large hiding just out of sight and wasn't really sure what their first encounter might be like.

John entered the water after readying his camera gear for our next dive, this one would be just for fun. As soon as his fear-

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less Dad came within reach, Dan released his grip slowly from about my neck and then made a mad dash for his big strong 'Dad.

Snorkeling around, we watched a myriad of fresh and brackish water fish chasing each other below. Suddenly, I looked around and directly behind John and Dan, I spied the familiar snout protruding above the surface. I submerged and gave the signal for them to turn around. As they turned, they came face to face with one of the largest males we had ever seen. Dan clung even tighter to John and climbed slowly up and around on his back. The big old bull didn't seem to mind our presence as he proceeded to munch slowly on the grass he had brought to the surface. When Dan saw that no menacing moves were being made, he began to slowly come out from behind his shield. Manatees have a tranquilizing presence that immediately began to win Dan over. He soon relaxed his grip on Dad and eventually slid down to hold hands an arm's length from his shelter. We gave the signal and surfaced simultaneously to exchange comments on what we had seen. Just as we again lowered our masks into the water we noticed the manatee's tail slowly fanning out of sight. John and I both raised our heads from the water in delight as we heard a familiar little voice calling muffled through his snorkel, "Here, Manatee! Here, Manatee!"

On and off through the day we could hear that delightful chant. We are sure it

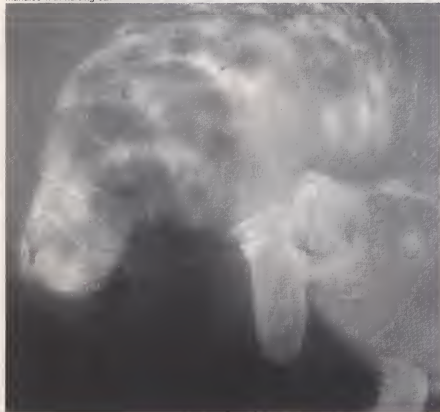
was more than coincidence, that on that particular trip we came upon more manatees than we had ever encountered before. It seemed we had a special rapport with nature that day. We roamed about, viewing the manatees feeding, playing, rubbing their backsides against large stones and mothers nursing their young.

Manatees would nuzzle against our sides or come up underneath our arms.

Several times during the day manatees would nuzzle against our sides or come up underneath our arms, begging for a little attention and possibly receive a little tummy rubbing. When you begin to rub their backs, they fold their flippers inward and roll over to expose their bellies, just like an old friendly dog. Slowly, all of the commotion began to die down, and what few animals we were seeing were lying motionless on the bottom or with little more than a tail showing from the dense foliage. They weren't the only ones worn out from all the play, so we proceeded back to our motel with the memories that will be with us always.

S

Manatee with nursing calf



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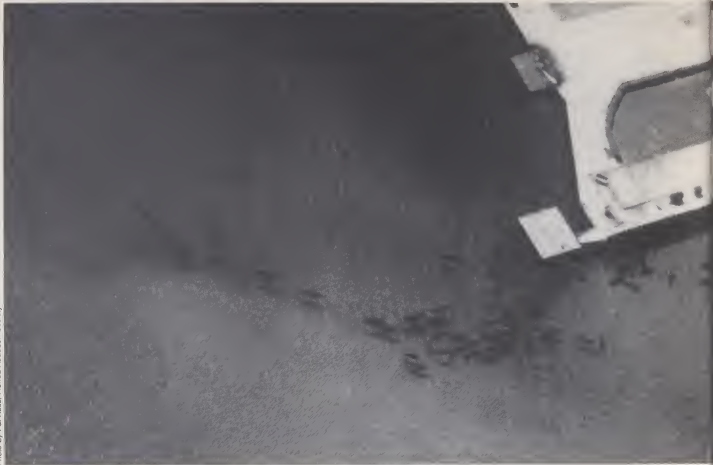
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Warm water discharge from power plant, above, attracts large numbers of manatees. Divers; below, enjoy encounter with friendly manatee.



For nearly a decade, Florida has spotlighted the plight of the endangered manatee, which some scientists fear could become extinct within our lifetime. Florida has officially declared the entire state a manatee sanctuary and even used the voice of singer Jimmy Buffet to help generate public awareness to the manatee's drastically reduced numbers.

Ironically, while generating publicity, Florida—the only state with a resident manatee population—has provided very little money to back up its posture of concern. In fact, the monetary support forthcoming not only has been shockingly inadequate, it's been doled out at a rate that's failed to provide the rapid, urgent relief necessary to ensure the survival of this unique species that's become such a favorite with divers and winter visitors to the state.

At present, Florida allots a maximum of only \$250,000 a year for manatee research. These funds come from the Motorboat Revolving Trust Fund, which is collected for motorboat registrations. A whopping \$100,000 of the total research funds goes into recovering and performing necropsies on the 80 to 100 manatees that die each year.

M. Timothy O'Keefe is Editor-At-Large for *Florida Sportsman* and a frequent contributor to major outdoor publications. His photo credits include *Time*, *Life* books and *National Geographic*.

tees that die each year. This task was formerly carried out by the U.S. Fish & Wildlife Service, a federal agency that has suffered drastic funds cuts.

The rest of the \$250,000 covers salaries for a handful of full-time biologists, travel, equipment and other expenses. Amazingly, because of the money shortage, there are no research stations on Florida's east coast, where 80 percent of the manatees die each year, and only one person is officially involved in manatee research in that region.

The bulk of funding for all projects in Florida comes from its General Fund, which totals scores of millions of dollars each year. For manatees, the state donates a paltry amount from its monetary storehouse; it pays only for the salary of Pat Rose, the manatee coordinator of the Department of Natural Resources.

The only other funds available for manatee work are an estimated \$35,000 to \$40,000 a year from the federal government (which has been cutting back support) and another \$20,000 in voluntary donations from boaters at the time they register their vessels.

All this comes to a total of about \$300,000 a year. Critics of the state's funding efforts point out that non-resident divers alone pump almost that amount into the economy of the Crystal River area





each winter when divers flock from around the country to swim with the manatees.

As one dive shop owner pointed out, "Florida remarkably underfunds a lot of vital services, such as road building and education. But roads and schools can always be built later. If we don't start doing more to help the manatees now, there won't be any 'later' for them."

Florida Department of Natural Resource manatee coordinator Pat Rose admitted his group could do considerably more if just another \$100,000 to \$150,000 was available annually. "We could do more if we had more money," he said. And if the funding seems woefully inadequate, manatee researchers say it's still a tremendous improvement.

Because of limited funding, Rose said his office has been forced to concentrate on attempting to control the immediate, direct cause of manatee deaths, as opposed to taking a longer range view and tackling the most serious threat posed to the manatee's existence: habitat destruction. Yet, as Rose pointed out, "Habitat work is the long-range salvation of the manatee as a species." Reduced habitat is what caused manatee numbers to dwindle in the first place.

Today, most manatee die from injuries sustained by collisions with motorboats. Many manatees also die from exposure to cold and other unidentifiable reasons. "Sometimes we just can't determine the cause because the bodies are so decomposed or nothing is apparent," Rose said.

Without significant funding, Florida's manatee program can have little effect on the animal's survival.



"But the leading identifiable cause of mortality is motorboats. It's been running about 50 percent but may be starting to go higher."

Rose is quick to point out that boaters and the divers who sometimes drive them are not "bad guys" in the manatee situation. It's a matter of people and manatees sharing the same waters. To reduce the chance of collisions, 21 areas have been designated manatee sanctuaries where boating is not allowed when manatees are present. On many other waterways boaters have been required to lower speeds drastically to no-wake or idle speeds, so manatees will have a chance to escape if they're unlucky enough to surface in a boat's path.

Rose said the state may soon have to start spending multi-millions in law enforcement to back up all the existing statutes and new initiatives about to be proposed. "There will probably be a significant addition of regulatory zones, including a number of slow speed zones that are channel exempt. Florida is going to have to spend a lot more on enforcement efforts," he explained. Up to this time, manatees have received little support, with most law enforcement efforts being

Mandate By M. Timothy O'Keefe **Without Muscle**

Adopt a Manatee



It's probably unfair to compare a manatee to a Cabbage Patch Doll, but neither are the prettiest looking things in the world, yet both can be adopted.

Only the funds for manatee adoption don't end up in some company's bank account. The money promotes public awareness programs and badly needed manatee research.

Since November, 1984, it's been possible to adopt a manatee through Save The Manatee Club, an affiliate of the Florida Audubon Society. The group was co-founded by Florida Gov. Bob Graham and its chairman, singer Jimmy Buffett.

For \$15, you can adopt one of the 26 manatees that regularly visit Blue Spring State Park, the first manatee sanctuary in Florida. You can even choose your own manatee from a list

that includes such names and descriptions as, "Tithonus," named after a character in Greek mythology who was granted eternal life but not eternal youth. This adult male was first noted at Blue Spring in 1984. His back bears a distinctive pattern much like a row of porpoises.

"Phoebe," who is easily identified by the disfigurement of her flipper, a result of entanglement in discarded monofilament fishing line. First seen in 1970, she is known to have produced at least five calves.

The adoptee receives a complete kit including adoption certificate, identifying photograph, individual history, and periodic updates on movements and behavior through the club newsletter and other materials.

The adoption fee is \$15 for individuals and \$10 for school classes. Complete teaching kits for schools are also available. For full information, write: Save the Manatee Club, 1101 Audubon Way, Maitland, FL 32751. **S**

concentrated on drug patrols and protecting marine fisheries.

Yet Rose admitted that reducing mortality from boat collisions is only a stop-gap measure in face of the manatee's greatest threat, the loss of habitat. "Even if we

stopped every direct kill by a boat, eventually we still would reach a point where the state couldn't maintain a manatee population. Right now the question looming before us is whether the species will ever be able to recover."

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State biologist Brad Weigel estimated that as much as 80 percent of the sea grass beds that manatees depend on for grazing have disappeared over the last 30 years. Weigel cited toxic runoff as the reason for such a drastic destruction of the manatee's vital food resource. "Runoffs of fertilizer, pesticides on lawns, oil from the roadways—they've all contributed to the destruction of habitat," Weigel said.

He continued, "It's taken years to destroy the grass beds, and it will take years to fix the situation. But you can't do it for small amounts of money." Rose said a lack of money has stalled the vital habitat restoration work.

The manatee, Rose said, has become an important barometer of the state's whole ecosystem. "The problem facing Florida's habitat is bigger than the manatee. But we will be using the draw of this species to help our entire ecosystem."

"I have to hope we haven't already reached a point where the habitat will be a limiting factor in restoring the manatee. I think we can restore it in certain places, but restoration on a large scale just won't work. It would take so much money, so many billions of dollars to turn things around."

"What we've got to do is keep it from getting worse. Anything we lose now in terms of habitat will probably be lost forever," Rose said.

As part of the habitat protection program, the DNR is scheduled to soon unveil a master plan that will affect virtually every boater in the state and also significantly impact where and when future waterfront development will be permitted.

Rose believes the public awareness

programs of the past decade have helped dramatically increase support for the manatee, but he pointed out, "You can only do so much with public awareness. You need to go to reasonable controls where there is a lot of congestion with manatees and boaters. One of the things we're considering is a moratorium on multi-slip marina construction. We're meeting with the marine industry to let them know what we're planning. We're approaching a time where we'll have more direct confrontation."

Rose's Department of Natural Resources, will also be working with the U.S. Fish & Wildlife Service in its manatee research, but that federal agency has suffered severe cutbacks recently. Rose said both state and federal programs are needed, that it's impossible for the manatees to survive on just help from the state level.

In the meantime, while researchers are scrambling and hoping for added research funds, how are the manatees holding up? Apparently the manatee population is remaining close to 1,200 animals despite the loss of between 80 to a 100 each year. To sustain a steady population, manatees need to be reproducing at a maximum rate, which is about one animal every two years. According to Rose, it appears manatee births are about equal to the deaths.

Rose, incidentally, is the official who would be instrumental in having any new restrictions passed that would prevent divers from interacting with manatees at Crystal River. He said there should always be plenty of spots to observe and photograph manatees, although it may be necessary to enact more no-entry zones to give manatees a place to retreat from people because of the tremendous number of divers.

CAMERAS

(Continued from page 39)

ing and dry it. Then wrap tissue paper around every shaft and every fitting going through the bulkhead on the inside of the camera, and close the empty housing. Holding the housing perfectly level, descend to about 15 feet and work all the controls. Repeat the procedure at 30 feet. Ascend, still holding the housing level. When dry, open it and check to see which piece of tissue paper is wet. Then change that gland or O-ring and repeat the test procedure. Remember, always test a housing empty after it has been worked on.

If fresh water is available to rinse underwater cameras every day, by all means take advantage of it. If not, they will still work well through a week or more of diving if a careful routine is followed. Wipe off excess moisture with a towel immediately after the dive and put them into King Tut's Tomb, or your equivalent. If salt droplets have crystallized, rinse the equipment in salt water and dry it before opening.

There are times when film must be changed between dives, but even that can be done in an organized, methodical manner. This is always a delicate and risky operation for the camera. Find a spot on the boat where you can be off by yourself for a few minutes. Spread out everything on a dry towel. Remove your wetsuit top, dry your face, arms and hair on another towel. Keep the camera open for as little time as possible to prevent a stray water droplet or sand grain from getting inside. The work area is like an operating room; everything should be kept clean. Don't do too much to the camera at this time. Just change film and check the sealing surfaces with a fingertip. Lube them only if they feel dry, and put the grease on the sealing surface instead of the O-ring. If everything worked on the previous dive, there is no need at this time to regrease O-rings.

If there were problems with the strobe, try to trace them by isolating the source of failure through the process of elimination. An ohmmeter can be helpful, but sometimes will show current going through a connection which is below the threshold needed to fire the strobe. Try shorting out contacts, beginning with the male connector, then adding the various components to the system. The most maddening failure is pressure related. The strobe works on land and not underwater. It is usually caused by a short inside the cord, due to the breakdown of insulation between wires. The only fix is a spare cord, or a spare strobe.

After assembling the camera gear, always test fire the system topside. As soon as you get underwater with it, test fire it again. Although a frame of film or

two are wasted, this routine can prevent a wasted dive.

Many photographers hang their cameras from lines under the boat to avoid handling errors by inexperienced crew members. Sometimes that isn't feasible when dives are made in strong currents or heavy wind chop, or when the boat is anchored on a reef so shallow that the keel bounces on it. All of those conditions could prove unhealthy to a tethered camera. Therefore, you will have to depend on the boat crew to handle the cameras. Make sure they understand how to handle the gear and where to place it.

When returning from a boat trip of several days to a week, soak the cameras thoroughly and then repeat the nightly maintenance routine. A little vinegar added to the water will help dissolve salt. For a housing, remove all the shafts. Clean excess grease from the glands with a Q-tip, then lightly grease the O-rings inside. Be careful not to get cotton fibers on the O-rings. Pledge Furniture Polish, used in conjunction with a soft cotton cloth, is excellent for cleaning both the inside and the outside of Plexiglass ports.

There are no absolute guarantees against camera failures. But by following these suggestions, problems will be minimized and you will come back home with many of the shots you dreamed about taking.

\$

The manatee population is remaining close to 1,200 animals.

"Most divers are OK, but you do have individual divers who are a pain in the rear," Rose complained. "You find some people who will pursue the animals to the bitter ends of the bay. Most cases I know about are tourists who feel that because they came from such a long distance, no one is going to tell them they can't ride a manatee."

"Still, there is some inadvertent harassment when divers keep following the animals around. That's why the no-entry zones can be very helpful," Rose said. **\$**

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Trivia Answers

1. Moby Dick
2. d) 800
3. Red. White muscle cuts in when a burst of speed is required.
4. Nitrogen narcosis.
5. Manatees. Dugongs are mammals.
6. a) day
7. a) fresh water
b) cool, dry
c) direct sunlight
8. 50 feet
9. San Diego
10. strap
11. a) French
b) Swiss
c) Italian
d) Spanish
12. capillary, boudon tube, diaphragm
13. a) Underwater Demolition Team
b) Pound Square Inch
c) National Association of Cave Divers
14. The tail of sea snakes is oar-like;

vertically oriented.

15. Rancho Dominguez
16. snails
17. red tide
18. True. All true jellyfishes possess cells that contain nematocysts (stinging structures) which may be discharged when stimulated.
19. A tall jar with a narrow neck and base and two handles, used by the ancient Greeks and Romans.
20. John the Baptist (sorry about that)

COZUMEL

(Continued from page 47)

shaped ring of coral columns on a steeply sloping wall, it has more tunnels than a beehive. Windows in the coral, framed by multi-colored sponges, open up to deep blue vistas. We emerge from these passageways not knowing whether to look up or down—a majestic scene unfolds in

both directions. At one point, however, we're looking in the wrong direction. No one spots the statue of Jesus called "The Sacred Protector of the Ocean." And even if one of us had, there would be no way to turn back and show it to the others.

Back on land the pace slows considerably. On Cozumel, the current is the only thing that moves quickly. We're dropped back at the dock near the hotel between 4 and 5 p.m. Most of our free time is spent making decisions: Where to have dinner. What bathing suit to wear. Whether to have another margarita.

We generally don't venture into San Miguel, Cozumel's only town of any consequence, until well after sundown. There's not much reason to—most of the

businesses are closed from 1 to 5 p.m. for siesta. The souvenir shops and other retail operations then stay open until 8 or 9, but there are as many people on the street at midnight as there are at 7:30 (or as few, depending on what you're used to).

The main street in town, Avenida Rafael Melgar, runs along the waterfront. The business district extends about a dozen blocks along this street and is five or six blocks deep. Most of the activity is within two blocks of the central plaza. As we walk along the street, poking our heads into one souvenir shop after another, young Mexicans offer to sell us small packets of Chiclets or conch shells "almost free." They are practicing to be like their older brothers, who pull us into shops along the side streets, asking if we see anything we like and, if so, what price we'd like to pay.

Actually, we do very little bargaining. Most of the shops in town are "fixed price" stores, and there seem to be fewer street vendors here than in some other Mexican towns. Still, the shaken Mexican economy makes almost anything we buy a bargain.

Tomas, whose family moved to Cozumel from the Yucatan mainland about 10 years ago, says the island is changing. Once only game fishermen and hardcore divers visited the place; today the business district is growing to accommodate droves of divers, casual tourists and the millions of day visitors dropped off by the cruise ships that have become a common sight at the docks. There is new construction everywhere along the three mile stretch between town and the hotels near the International Pier. The roads are being torn up so a new drainage system can be installed. They've been that way for two years, a taxi driver tells us, and it will be at least another year before they're finished.

It seems impossible to hurry in Cozumel. And impossible not to want to hurry back.

S

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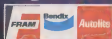
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8. 50 feet
9. S
- 10.
- 11.
- 12.
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- Dive
- 14.

COZUMEL

(Continued from page 47)

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It seems impossible to hurry in Cozumel. And impossible not to want to hurry back.

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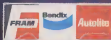
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Boats meet divers right on the beach.

TEMPTATION

(Continued from page 42)

where manta rays wait in line like car washes, spilled a couple thousand gallons of brilliant paint down there, it would be Tübatáha. In fact, divers didn't have much to do with the manufacture of the place, but just the same, if a suggestion box were planted at the dive site it would remain empty.

On the limited-access, 300-foot floor, other treasures lie waiting, among them a Nikonos V with a 15mm lens, Subsea Strobe and some gorgeous exposed film

deposited May 3, 1986. The exact location I'll not reveal. As it bounced in slow motion off ledges on the way down, it lured its pursuing owner to a depth of 250 feet, bursting all the blood vessels in her eyes during descent. She got within two feet of the camera, when the sea, ever so gently, tugged it away.

About an hour by pelican, a group of sheltered islands known as the Visayas wade about in some of the Philippine's clearest and warmest water. The beach of Bohol Beach Club drops off a ledge about 100 feet from shore to a depth of 170 feet. Sitting in the boat, you can practically see the bottom, without a face mask. Underwater, 15-foot fans dwarf divers, day-glow orange sea anemones burn up film, mushroom-shaped islands invert perspective. Cervera Shoal, guarded by hammerhead sharks and intimidating currents, is well worth the risks. Upon approaching one portion of the wall, nearly 40 poisonous sea snakes rush out past the approaching divers. Should you choose to catch one for entertainment, keep its mouth away from the webbed skin between your fingers—one of the few places it can sink its tiny fangs.

Tanks, air and weight are available on almost every major island in the Philippines (only 10 percent of the 7,000-plus scattered islands are inhabited at all), as well as a variety of dive boats ranging from outriggers to live-on, 30-passenger yachts. Regulators can be rented but most divers prefer to bring their own, along with mask, snorkel and fins. Bohol Beach Club, a typical resort that caters

to divers, rents regulators for \$8 a day; B.C.'s \$5; weights \$1; a dive tour package with tanks, air, backpack, weight belt, boat and guide costs \$30 a day.

Hobie Cats, sailboards, and sailboats compete with inland trips while the tanks are refilling. I'd suggest a cultural experience over the sporting variety and you won't have far to go. Most Filipinos speak English and all are friendly. Kids everywhere call out, "Hi Joe!" and invitations for dinner pile up glutinously. Jeepneys, a kind of hybrid bus/jeep crossover dominate mass transit and cost a nickel to travel just about anywhere. "Tricycles" or motorcycles with sidehacks allow more customized travel and require bartering before embarking. More than \$10 per day means you're being taken—besides to your destination. Same for taxis but at \$20 a day.

Don't miss the fish market every morning, the strange natural phenomena called the Chocolate Hills that change color, cock fights held every Sunday, the sea gypsies who are born, live, and die on their outrigger boats, guitar makers, rope weavers and boat builders, who all love to be photographed. Talk to them. The locals can point out the uncharted shoals, virgin reefs, 15th and 16th-century shipwrecks as well as warships and kamikaze zeros, as often as not, undived upon.

If you're weary of wrecks and hunting for moving targets, you won't find a greater concentration of fish species and invertebrates anywhere in the world than at Batangas, a two-hour ride from Manila. One marine biologist, on one dive, counted 37 species of butterfly fish of the more than 100 known to exist there. The Caribbean has seven. Likewise, the Great Barrier Reef hosts 1,500 species of fish—the Philippines 2,500 to 7,000 depending on your source. You can dive all day and dive all night right off the beach where the water depth is only two feet in places. "If you get in trouble," says Lynn, "just stand up." Many of the sea creatures only emerge at night and some that do, like the flashlight fish, illuminate their surroundings with such intensity you can shut off your dive light and see by them. The Cathedral, complete with a cross blessed by the Pope, attracts green eels, lion fish, three-foot puffers, cuttlefish, nudibranchs, and smoking sponges for regular worship.

Over the years Lynn has photographed pinecone fish, scorpion fish, crinoids, sea squirts, one critter the Shedd Aquarium identified as a sea goblin and one they don't even know what family it would belong to. This is the place to find wildlife you've never seen before and, once in a while, those mankind has never seen.

That's the problem with the Philippines. If you ever want to enjoy diving anywhere else in the world, take my word for it, stay away.

Important Safety Notice

The Diving Equipment Manufacturers Association (DEMA) announced it has received reports from some of its members that difficulties may exist regarding the CO₂ inflator mechanism of certain buoyancy compensators, snorkeling vests, swim vests, or other buoyancy control devices.

Certain of these devices may have a potential problem with the pierce pin attached to the CO₂ inflator mechanism. Due to the potential breaking of pierce pins (which may not be apparent), the CO₂ inflator mechanism might fail to activate the CO₂ cartridge. This would result in the buoyancy control device failing to inflate from the CO₂ cartridge. However, the alternative methods of inflation of the buoyancy control device

are not affected.

If you have purchased a buoyancy control device since January 1, 1983, which has a CO₂ inflator mechanism, or has had a CO₂ inflator mechanism repaired or replaced or added since that date, and if it contains markings identifying it as a "Roberts Valve," you should not use the CO₂ inflator mechanism. DEMA strongly urges that each diver immediately cut the lanyard or string activator attached to the CO₂ inflator mechanism so that the mechanism is not readily available for use.

Buoyancy control devices are not life jackets and must not be relied upon for that purpose.

If you require additional information, contact your local dive store or the manufacturer of your buoyancy control device. Further information will be forthcoming from your local dive store and/or the manufacturer of your buoyancy control device.

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